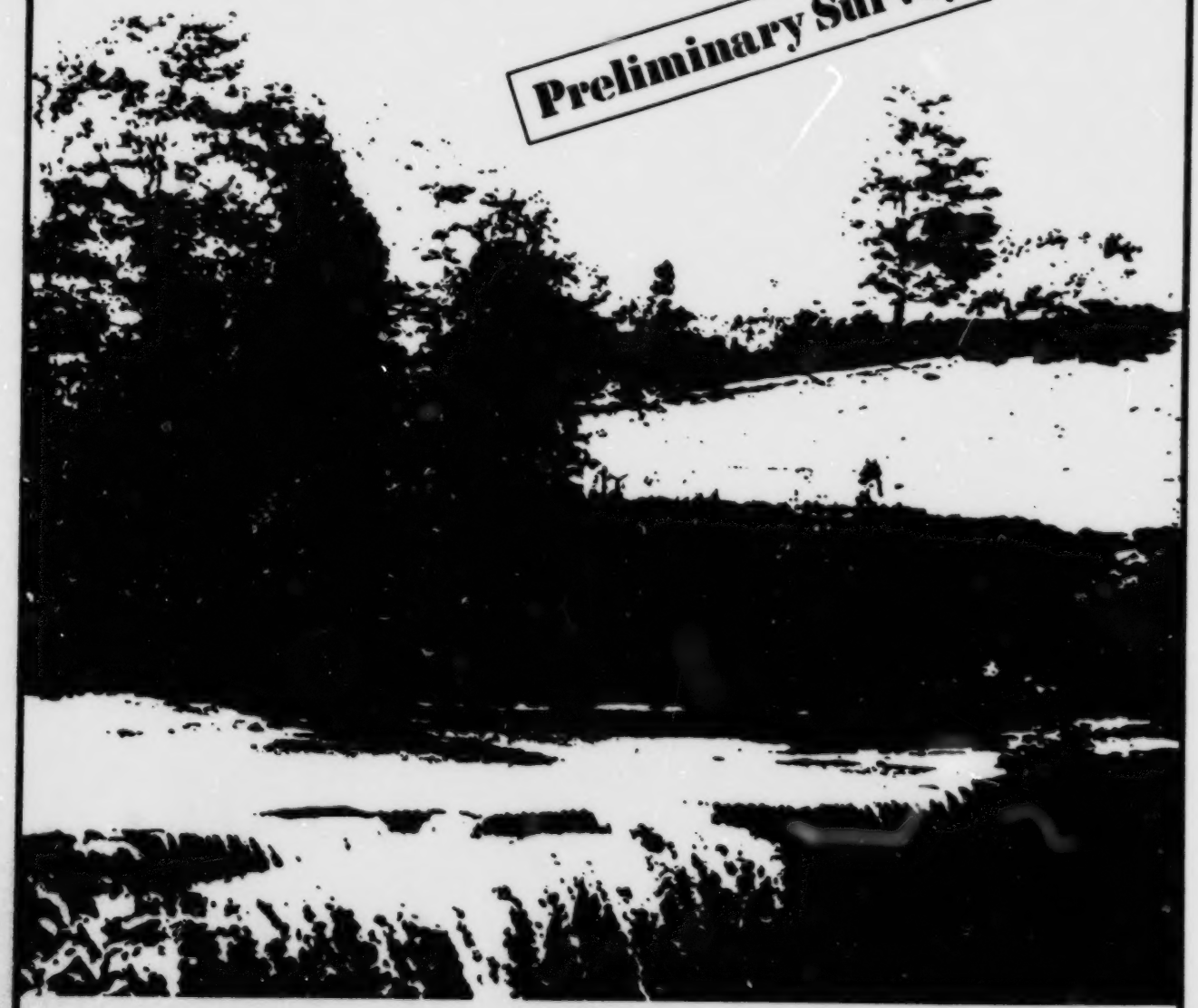
Regional NIAGARA

Natural Areas of the Niagara Region

Preliminary Survey



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NATURAL AREAS OF THE NIAGARA REGION:
A PRELIMINARY SURVEY

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NATURAL AREAS OF THE NIAGARA REGION: A PRELMINARY SURVEY

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NATURAL AREAS OF THE NIAGARA REGION: A PRELIMINARY SURVEY

INTRODUCTION

Natural areas are often appreciated though rarely adequately valued. This can lead to their elimination. Although most of the natural habitat of Southern Ontario has been removed over a period of two hundred years of settlement through forest clearing and the draining of wetlands, Niagara remains blessed with a rich variety of wildlife and vegetation.

A 1981 national study published by Statistics Canada gives some indication of the important values attributed to natural areas by the general public. The following table summarizes some of the key findings of this national survey.

THE IMPORTANCE OF WILDLIFE TO CANADIANS*		
Canadian Attitudes	Millions of Adult Canadians	Percent of Adult Population
Number involved in some form of wildlife-related activity	15.5	83.8
Number who value as important the maintenance of abundant wildlife	14.8	80.8
Number who value as important the preservation of endangered species	15.2	82.0
Number who fed, watched, studied or photographed wildlife near home or cottage	12.3	66.5
Number who made special trips or outings to encounter wildlife (except hunting)	3.6	19.4
Number of memberships in wildlife organizations	1.1	6.0
Number who encountered wildlife during trips or outings	8.1	
Number whose enjoyment of the trip or outing was significantly increased	7.5	92.5

*The Importance of Wildlife to Canadians: Highlights of the 1981 National Survey. Statistics Canada, 1982

Many of the Niagara Region's residents are actively involved in nature appreciation and environmental groups. These include organizations evolving around local issues such as Niagara Against Toxins, Operation Clean, Kame Citizens Group, and West Lincoln Task Force Against Toxic Chemicals. There are also many local branches and representatives of larger organizations such as the Bruce Trail Club, Preservation of Agricultural Lands Society, the Conservation Council of Ontario, Federation of Ontario Naturalists, Ontario Federation of Agriculture, and other field naturalist and conservation clubs.

One current example of the interest in the Niagara Region's natural environment is the Landowner Contact Program being undertaken this year in the Jordan Valley by the Natural Heritage League. Jordan Valley is one of nine Carolinian forests identified in the Niagara Region. (A 24 hectare section of this valley was recently given by a local businessman to the NPCA to be conserved for future generations). The Carolinian Canada Project is a joint venture of the League, the Ministry of Natural Resources, the Federation of Ontario Naturalists, the Ontario Heritage Foundation, the Nature Conservancy of Canada, and the World Wildlife Fund. The latter group has singled out the Carolinian zone as one of two or three of North America's areas of high genetic diversity. Niagara, along with the rest of the north shore of Lake Erie, is the only region of Canada which accommodates the beautiful Carolinian species such as Sassafras, Tulip Tree, and Cucumber Magnolias. This type of natural habitat requires sensitive planning evaluations prior to development decisions being made.

In recent years, several regional municipalities and conservation authorities in Southern Ontario have carried out background studies and engaged outside experts to identify areas with high quality natural environment. These studies have been in response to the public's growing interest in environmental matters such as the preservation of high quality natural areas. Often these areas are designated in official plans and/or watershed management plans as natural environment, environmental protection, or environmentally sensitive areas. The name used varies from jurisdiction to jurisdiction but the essence of the designated areas is noticeably similar. These natural areas possess distinctive landforms, watercourses, wetlands, forests, or are otherwise important to the existence of wildlife and flora.

Several studies have been undertaken concerning natural areas in the Niagara Region. These include the Brock University report entitled, "Environmentally Sensitive Areas" (1980), and the Philips Planning and Engineering Limited's Official Plan Studies Report Number 11 entitled, "Potential Recreation Areas and Fragile Biological Sites Inventory and Recommendations" (1972). Other sources of information regarding the Niagara Region's natural areas are listed at the end of this report and these are referred to throughout.

There has been little attempt made in the past to comprehensively consolidate and rationalize these divergent sources of information into a single source describing the Region's natural areas. The Policy Plan contains a map which identifies environmentally sensitive areas in a schematic way. The location and limits of these areas are approximate and the Plan recognizes that there is a need for "...more detailed identification, inventory and analysis of the natural features of the Region in order to better determine the degree of sensitivity of each area."

The information in this report will assist the Region in the review of environmental impact statements of proposed developments in or near natural areas. The significance of natural areas may be better judged based on detailed information. This report contains such details and is a step toward realizing the goal of preparing a revised set of policies for the use and management of natural areas. Policy 7.B.2 identifies the need to review the existing interim policies for environmentally sensitive areas (ESA's).

A fourth application of the information in this report is as background for a review of the ESA designations in the Policy Plan and local Official Plans. The Policy Plan recognizes the need for this and suggests that the Ecological and Environmental Advisory Committee (EEAC) could be asked to provide comments on ESA designations and policies in the Policy Plan.

OUTLINE

Natural areas in the Niagara Region are identified on a series of five acetate overlays that complement the descriptions in this report. These maps allow for easy identification of the location of the natural area. A schematic portrayal of the large overlays is included in this report as Appendix II. Where various categories for a natural feature are documented, only the provincially significant classifications are shown here. Fact sheets on each natural area, including their plan designations and public agency classifications, are found in Appendix I.

The majority of this report describes the natural features and their significance in summary fashion. The following section, entitled Background, briefly lists the advantages to preserving our natural areas. The fourth section, Natural Areas Associated With the Niagara Escarpment, describes the common features of these Escarpment-related natural areas, followed by a brief statement about each area ordered geographically from east to west across the Niagara Region. The fifth section, Wetlands As Natural Areas, begins with an explanation of the different types of wetlands and their functions, followed by a brief statement about those wetlands classified by the Ministry of Natural Resources, additional wetlands, and areas of important fisheries and waterfowl habitats. In the sixth section, Other Natural Areas Important to Wildlife and Flora, a description of the habitat functions of the various natural areas is followed by the statements about each area organized into five subsections: woodlots; forested recreation areas; wet forests; unusual landforms; and, other sites of rare flora and fauna. A brief Summary and Conclusions section is followed by a Glossary of terms used as natural area classifications and a list of References used in creating the written report and the maps.

In addition to the local studies mentioned previously, information was gleaned from the Ministry of Natural Resources (MNR), The Niagara Escarpment Commission (NEC), The Niagara Peninsula Conservation Authority (NPCA), The International Biological Programme(IBP), and the Carolinian Canada Project. At every stage of the process of assimilating the data, attempts were made to retain information about only the most important and provincially significant natural areas in the Niagara Region. Data about regionally extirpated, endangered and threatened species were routinely kept. Information about species rare to Ontario or Canada was also noted, such as the Carolinian species and animals requiring expanses of land as habitat (eastern cougar and timber wolf, for example). In the process, some very significant natural attributes of the Region which were already well known and without need of further study were not documented here. One example of this is the Comfort Maple. With regard to the acetate maps,

many of the sites identified in the Philips report are not displayed since they have been adequately covered by public agency classifications. They are, however, included in the natural area fact sheets of Appendix I.

Conservation areas determined by the NPCA not to have significant natural areas were not included in this report. Escarpment natural areas, the highest order of preservation designated in the Niagara Escarpment Plan were noted and mapped, though other areas under NEC jurisdiction were not. Marginally sensitive areas identified in The Brock University report were not mapped. There is an inherent assumption that they are less important than natural areas that fulfilled 4 or more of the established criteria and are referred to as Environmentally Sensitive Areas.

BACKGROUND

The natural appeal of Niagara Falls and the Niagara Escarpment draws attention to the quality of the environment of the entire Region. The tourist industry developed around some of these natural features that attract visitors from outside the Region. The entire economy benefits from a healthy tourist industry, and preserving natural areas maintains the inherent amenity and recreation values to everyone's advantage. The image of a healthy natural environment generally adds to the Region's quality of life.

Natural areas contribute to the health of the Region's inhabitants in more tangible ways. They function as aquifers for the filtering and replenishing of groundwater used for domestic and agricultural purposes. Some of these areas function as flood control mechanisms, a natural safety feature for all land uses. They act as gene pools for the propogation and preservation of species. Natural areas provide quality habitats for threatened, endangered, rare or significant plants and wildlife. Furthermore, game animals are dependent upon wetlands and forested areas for cover, food and breeding grounds.

The Niagara Region is blessed with a moderate climate which accommodates remnant Carolinian Forests, rare to Canada. Pristine or largely undisturbed areas are a rare enough thing in urbanized locales, and are therefore the subject of scientific study. Our natural areas provide local educational institutions with accessible and ready-made outdoor laboratories.

NATURAL AREAS ASSOCIATED WITH THE NIAGARA ESCARPMENT

Common Features

The Niagara Escarpment is a narrow, linear (east-west), sedimentary rock outcrop which dissects the entire Niagara Region, separating two distinct physiographic areas of different elevations: the Lake Ontario (Iroquois) Sand Plain below and to the north; and, the Haldimand Clay Plain above and south to Lake Erie. The scarp face and crest are relatively undisturbed by human activity, interrupted occasionally by road cuts and utility corridors. The plain forest below has largely been replaced by agriculture or urban development. Pits and quarries, active and abandoned, frequently jut into the Escarpment and the Fonthill Kame.

The Escarpment is irregular in height, steepness of slope, vegetation cover, and topography. Promonotories with magnificent vistas, spectacular waterfalls and incised valleys, all covered or surrounded by forests, create amenity values and recreation opportunities. The variability in habitat encourages species diversity. The linear continuity and extent of the habitat accommodates rare and extensive habitat species and facilitates interchanges between distant biological communities. Finally, the landform itself is distinctive and unusual, and is therefore a feature of provincial significance.

Niagara River Gorge/Queenston Heights/St. Davids/Woodend

The Niagara River Gorge, from the Horseshoe Falls to the Whirlpool and the rapids beyond, is the largest river gorge in Southern Ontario. Its exposures of bedrock formations offer excellent opportunities for geological study. Included in this natural area are Niagara Glen Park, Queen Victoria Park, and Dufferin Islands. The river itself is considered to be a provincially significant cold and warm water fishery.

Queenston Heights is an Escarpment promonotony overlooking the Gorge. It possesses historical importance as a major battlefield during the War of 1812 and geological importance as the original post-glacial location of Niagara Falls. A margin of land south of York Street, in the village of Queenston below, exhibits a portion of the glacial era Lake Iroquois shoreline.

The St. Davids section of the Escarpment, west of Queenston Heights, contains several interesting features. The St. Davids Buried Gorge has geologic evidence which suggests a second branch, now underground, of the Niagara River. Mewburn Gorge, St. Davids Waterworks, and Fireman's Park are other local features of this site. In Queenston, fossilized sand dunes and sand hills formed by Lake Iroquois are found at Mountain Road and Dorchester Road in Niagara Falls.

Woodend is another magnificent promonotory, located along the Homer section of the Escarpment just west of and overlooking the Queen Elizabeth Way/Highway 405 interchange.

Short Hills/Fonthill Kame

This complex of glacial topography comprises many hills cut with a series of stream valleys within the Twelve Mile Creek re-entrant valley, eroded into the Escarpment by ancient rivers. Directly south of this is the Fonthill kame delta moraine, a large glacial landform which dominates the landscape of the Town of Pelham. The two major tributaries of Twelve Mile Creek run through Effingham and St. John's. The St. John's valley may have the greatest diversity of plant species in all of the Province. Large portions of the Short Hills are in public ownership, including a provincial park and an established conservation area.

DeCew Falls/Rockway/Louth/ Balls Falls/Beamer's Falls

At each of the above, the waters of Twelve Mile Creek, Fifteen Mile Creek, Sixteen Mile Creek, Twenty Mile Creek, and Forty Mile Creek (respectively) cascade over the Escarpment, causing spectacular waterfalls, deep valleys or gorges. They are scenic as well as of great education value. All, to some extent, are in public ownership.

Cave Springs/Mountainview/Woolverton

These three sections of the Escarpment are Conservation Areas. They are important as largely undisturbed, typical, forested strips of scarp face and crest held in public ownership for conservation purposes. Cave Springs is located along the Escarpment, south-east of Beamsville in the Town of Lincoln. Mountainview is south-west of Beamsville near Thirty Mile Creek. Woolverton is Ontario Hydro property atop the Escarpment in Grimsby, between Grassie Road and the Hamilton-Wentworth boundary.

WETLANDS AND WATERCOURSES AS NATURAL AREAS

Types of Wetlands and Their Functions

Wetlands are lands permanently or seasonally covered with shallow water, where distinctive soil conditions, plant and wildlife communities develop. There are four wetland types: swamp, marsh, bog, and fen. More than half of the wetland areas in the Niagara Peninsula are swamps. A swamp is a wooded are of greater than .5 hectares, where standing to gently flowing surface waters occur seasonally or persist for long periods.

Marshes are the second most extensive wetland type in the Region. A marsh is a non-wooded area of greater than .5 hectares that is periodically inundated with standing or slowly moving water, and includes areas of open shallow water. Permanently inundated areas are characterized by robust emergents, submergents, anchored floating plants, and other aquatic rather than terrestrial species.

A small percentage of the Region's wetlands are bogs. A bog is a peat-covered area of greater than .5 hectares or peat-filled depressions with a high water table and a surface of carpet mosses (primarily Sphagnum). Less than ten percent of the Region's wetland areas are fens. They are similar to a bog since they are a peatland, characterized by surface layers of decomposing peat over a base of well-decomposed peat. Having a less conspicuous water table than a bog, a fen is predominantly covered by sedges, but may have shrubs, Tamarack, and White Cedar. Regardless of type, distinct wetland units may be evaluated as one "wetland complex" where they are no more than .75 kilometres from each other, separated by uplands or other functional discontinuities.

Wetlands serve many valuable functions. They provide habitat for fish, waterfowl, and other wildlife. They enhance water quality and replenish water tables. They aid in regulating flow, which protects against flooding and alleviates drought. Wetlands also support recreation activities such as hunting, fishing, nature appreciation and study.

MNR Classified Wetlands

The Ministry of Natural Resources (MNR) has created wetland quality categories as part of an ongoing program to classify all areas with wetland values, from Class 1 (best representation of provincially significant wetlands) to Class 4 (marginal regional significance) to Class 7 (minor wetland functions present). So far, the Niagara Region has been attributed with four Class 1, four Class 2, one Class 3, and one Class 4 wetlands. Within Niagara, MNR has ranked the quality of the wetlands within each of Class 1 and Class 2. A brief description of the classified wetlands in descending order follows.

Class 1: Wainfleet Marsh

- largest wetland (1,526.4 hectares) in the Niagara Region;
- 40% bog, 31.5% swamp, 27% fen, 1.5% marsh;
- more than one-third has been lost to peat extraction and agricultural activities;
- accommodates endangered and regionally extirpated wildlife species;
- active feeding area for colonial waterbirds.

Wainfleet Wetlands

- swamp and marsh created, in part, from inactive and rehabilitating limestone quarries;
- Eagle Marsh Drain, another man-made feature within the Wetlands, has become an important local fishery.

Lyons Creek Wetlands

- linear marsh of 150.5 hectares in Welland and Niagara Falls;
- provides habitat for a wide selection of wildlife, with several provincially significant species.

Willoughby Marsh

- 363 hectare swamp in south Niagara Falls;
- provides habitat for significant and rare wildlife;
- forms the headwaters of Ussher's Creek, Tee Creek, and tributaries of Black Creek.

Class 2: Fifteen Mile Creek Estuary

- forms a 23 hectare wetland complex with the "drowned" mouth of Sixteen Mile Creek;
- high quality examples of Lake Ontario plain marsh and drowned valley bottomland forest;
- highly diverse vegetation patterns;
- many rare species and large populations of waterfowl;
- important warm water fishery from Rockway Falls to Charles Daly Park.

Humberstone Marsh

- similar to Willoughby Marsh in significance;
- one of only three occurrences of a peat- and muck-filled basin in the Haldimand Clay Plain.

Twenty Mile Creek Estuary (includes Jordan Harbour)

- excellent, large (57 hectares) example of Lake Ontario plain marsh;
- significant species and colonial waterbird feeding area;
- important warm water fishery from just south of (above) Ball's Falls to Lake Ontario.

Point Abino Wetlands

- 153 hectares of swamp dominating the north half of the Point Abino Peninsula;
- provincially significant wildlife and plant species.

Class 3: Mud Lake

- 52% swamp, 48% marsh in Port Colborne;
- man-made depression created in 1921 during excavation work on the Welland Canal;
- now valued as a wetland complex and wildlife management area.

Class 4: Moulton East Wetland

- 70 hectare swamp in Wainfleet and Moulton Township of Haldimand-Norfolk;
- a true wetland complex (five distinct interlocking woodlots).

Additional Wetlands

The wetlands described hereafter have yet to be classified by MNR, not necessarily because they are inferior but often because information about them is lacking or undocumented. One such area, the Welland River between the Queen Elizabeth Way and the Welland Canal, has been identified by MNR as a potential Class 1 or 2 wetland. Similarily, South Ste. Anns Slough Forest north of Highway 20 in West Lincoln is a potential Class 2 wetland (swamp).

Virgil Dams is a 1.4 hectare marshland area created by the streamflow augmentation program of the Niagara Peninsula Conservation Authority (NPCA) on Four Mile Creek in Niagara-on-the-Lake. It is surrounded by six hectares of coniferous reforestation and one hectare of experimental plantings of exotic species known as the Niagara Nut Grove.

The Two-and Four-Mile Creek Mouths form a small but significant wetland in Niagara-on-the-Lake. The wetlands are surrounded by plain forest which provides Class 2 capability for white-tailed deer, according to the Canada Land Inventory. In addition, this section of the Lake Ontario shoreline is characterized by five metre clay bluffs.

Shriner's Creek is a riverine wetland that has evolved from a truncated stream. A portion of the headwaters of this stream has been acquired by the Niagara Peninsula Conservation Authority for water management purposes.

McNab Marsh is a small wetland at the mouth of Eight Mile Creek in Niagara-on-the-Lake near the St. Catharines boundary.

Allanburg Weir Swamp in Thorold South at the Welland Canal is a wetland created when the natural drainage pattern was truncated by the Canal.

Martindale Pond is a large wetland area in St. Catharines near where Twelve Mile Creek meets Lake Ontario. It is an important warm water fishery and wildlife area.

Port Robinson Duck Ponds is a wetland complex on the site of an old excavation in Thorold South. It consists of large ponds and swamp forest, with significant plant and waterfowl species.

Ridgeville Swamp is 13.76 hectares of wet forest amidst rolling sand hills. It is located on the south-west slope of the Fonthill Kame in the Town of Pelham.

Important Fisheries and Waterfowl Habitats

Lake Erie forms the southern boundary of the Region. From the Niagara River in Fort Erie to the western boundary with Haldimand-Norfolk in Wainfleet, the shoreline and near offshore are recognized as important fisheries, waterfowl and wildlife areas.

The Niagara River, south of (above) the Horseshoe Falls and north of (below) the Lower Rapids in Niagara-on-the-Lake, affords significant waterfowl habitat. The entire River is a provincially significant fishery, boasting the widest selection of cold and warm water fish species in the Niagara Peninsula.

Several smaller watercourses flow eastward from Niagara Falls, Welland and Fort Erie to the Niagara River. The lower reaches of Ussher's Creek, Bayer's Creek, Miller Creek, Frenchman Creek, and Black Creek are important warm water fisheries.

Lake Ontario, as a natural area, covers the entire northern limit of the Region. In addition to the river mouths described earlier, stretches of the shoreline provide alternating segments of beach and bluff. The offshore is an important fishery and waterfowl habitat.

Twelve Mile Creek runs north and east from spring-fed sources in the Short Hills and empties into Lake Ontario at Port Dalhousie. Its upper reaches, consisting of two tributaries, St. John's and Effingham (two branches), are the only cold water stream fisheries in the Niagara Region. From DeCew Falls to Lake Ontario, with flows augmented for Ontario Hydro purposes, Twelve Mile Creek is an important warm water fishery, as is the Lake Gibson/Lake Moodie complex above (south of) the Escarpment. Sixteen Mile Creek, from the Escarpment north to Lake Ontario, is also an important warm water fishery.

OTHER NATURAL AREAS IMPORTANT TO WILDLIFE AND FLORA

Habitat Functions

Large woodlots provide cover for deer, coyote and fox. Extensive forested tracts accommodate species such as cougar, timber wolf, and herons. Wet forests have an additional value in performing wetland functions. These areas are potentially subject to the Ministry of Natural Resources' classification program. Some topographic features are considered to be natural areas because they are such unusual landforms. Abandoned quarries and sand dune formations in Fort Erie and Port Colborne are examples of these. Other areas are considered natural areas for preservation purposes solely because of the presence of one or more rare species. Erie Beach in Fort Erie, for example, possesses the rare wild licorice plant.

Woodlots

There are nine high quality woodlots, ranging in size from the modest three hectare Zuk's Zone to the expansive Ruigrok Tract (also known as Caistor - Canborough Slough Forest) covering 530 hectares. Of particular note are the Southern Niagara Pin Oak Forest and Savannahs, and Navy Island. The latter is known for its well-established white-tailed deer population. In addition, its isolation from the mainland presents an example of island biogeography for scientific study. The Southern Niagara Pin Oak Forest and Savannahs has been identified by the Carolinian Canada Project as being an area with a large number of carolinian species. In summary, the high quality woodlots of the Niagara Region (and the municipality in which they are located) are as follows:

- Navy Island (Niagara Falls);
- Summer Street Woodlot (Fort Erie);
- Zuk's Zone (Niagara-on-the-Lake);
- Paradise Grove (Niagara-on-the-Lake);
- Rice and Merritt Road Woodlot (Pelham);
- Southern Niagara Pin Oak Forest and Savannahs (Thorold);
- Morgan's Point (Wainfleet);
- Chippawa Creek Conservation Area (Wainfleet); and
- Irish Grove (Grimsby);

Forested Recreation Areas

Stevensville and Smithville Conservations Areas, 49 hectares in Fort Erie and 4.45 hectares in West Lincoln respectively, are active recreation areas that have a planting and management program carried out by the NPCA.

Wet Forests

Wet Forests are woodlots with swamps and intermittent marshy areas. They perform such wetland functions as forming the headwaters of watercourses, regulating flows and recharging groundwater tables. From east to west across the Haldimand Clay Plain, they are as follows:

- Wavecrest Bush (Fort Erie, 43 hectares);
- Cyanamid Corners (Niagara Falls, 60 hectares);
- Forks Creek Woods (Wainfleet, 47 Hectares);
- Comfort's Bush (West Lincoln, 130 hectares);
- Hafeman's Bush (West Lincoln, 45 hectares);
- Sucker Creek (West Lincoln, 95 hectares);
- Moore Woodlot (Lincoln, 90 hectares);
- Siverdale Woodlot or South Ste. Anns Slough Forest (West Lincoln, 300 hectares);
- Fletcher Woodlot (Wainfleet, 30 hectares);
- Chambers Corners Clay Plan (Wainfleet, 20.2 hectares);
- Marshville Station Clay Plain (Wainfleet, 24.3 hectares);
- Leyburn Bush (West Lincoln, 125 hectares);
- Harold Mitchell Nature Reserve (Wainfleet, 43 hectares);
- Bartell's Bush (West Lincoln, 140 hectares);
- Spring Creek Bush (West Lincoln, 140 hectares);
- Bismarck Bush (West Lincoln, 40 hectares);
- Hardy's Wood (West Lincoln, 130 hectares);
- Garber's Grove (West Lincoln, 105 hectares);
- Durham Oak Grove (Grimsby, 40 hectares);
- Pot's Woodlot (West Lincoln, 105 hectares);
- McCready's Bush (West Lincoln, 100 hectares); and,
- Ruigrok Tract or Caistor-Canborough Slough Forest (West Lincoln, 530 hectares).

Unusual Landforms

Ridgemount Quarry in Fort Erie and Humberstone Quarry in Port Colborne may be considered to be natural areas merely because they expose bedrock formations and afford an opportunity for scientific study.

Ridgemount Raised Beach in Fort Erie is a rare example of an important glacial-era geologic formation, Lake Dana Beach Ridge. A similar example of this is just west of Sherkston in Port Colborne. It is known as Shisler Point Woods or Empire Beach Backshore Basin Forest, since it possesses an extensive (83 hectare) forested area atop the sand dune ridges. A third example of this phenomenon is Point Abino Peninsula Sandland Forest and Sand Ridges in Fort Erie. Nickel Beach Woodlot in Port Colborne is a 47 hectare continuation of the Lake Erie shoreline dune complex.

Other Sites of Rare Flora and Fauna

Erie Beach in Fort Erie includes an area of .5 hectares where wild licorice plants are found. This is reported to be the only station of this species in North America east of the Mississippi River. Miller Creek, just west of Miller Road in Fort Erie, hosts the only station of wild hibiscus in the Niagara Peninsula. Further downstream (and east of Miller Road), one of only four or five Kingnut Hickory trees in all of Ontario is situated.

At Rose Hill Road, next to the old Bertie Township Waterworks plant in Fort Erie, stands the largest Tulip tree in Canada. At the mouth of Ussher's Creek in Niagara Falls, is the first recorded location in Canada of the Green Arrow Arum plant. At the mouth of One Mile Creek in Niagara-on-the-Lake is the only known native Scarlet Maple tree in the Niagara Region.

At the corner of Progressive Avenue and 9th Street in St. Davids, there is the only known Canadian location of the true Katydid insect. Also present are the following regionally rare and significant tree species: Big Shellbark Hickory; Pawpaw; and Prickly Ash.

Garner Road Woodlot, south of Lundy's Lane in Niagara Falls, contains one of only four known Canadian locations of Round Leak Greenbriar Vine. Also present are the provincially rare Tupelo or Sour Gum trees. North of Holland Road at Highway 406 in Thorold is the only specimen of Prince's Pine in the Niagara Peninsula.

At the corner of Cream and Welland Streets in Fenwick (Pelham) stands the largest Cucumber Magnolia tree in the Niagara Region.

SUMMARY AND CONCLUSIONS

The following table summarizes the location of 90 natural areas found in the Niagara Region. The distribution by municipality of each type of natural feature is exhibited.

Wet forests comprise the greatest number of natural features in the Niagara Region. All are located above the Escarpment on the Haldimand Clay Plain, and the majority are found in the Township of West Lincoln.

The second most dominant type of natural feature is Escarpment-related. The Town of Lincoln has five of these features, and four are found in Niagara-on-the-Lake.

There are twenty wetlands, half of which have been classified by the Ministry of Natural Resources. Wainfleet and Port Colborne each have three of the classified wetlands Niagara-on-the-Lake has three of the additional wetlands. Niagara Falls also possesses three wetlands, two of which are considered to be Class 1.

There are nine areas considered to be important fisheries or important as waterfowl habitats. Fort Erie and Niagara Falls are particularly blessed with important fisheries.

Of the nine sites singled out for having more rare flora and fauna, one-third are found in Fort Erie.

Table 2

Distribution of Natural Areas

DISTRIBUTION OF NATURAL AREAS BY MUNICIPALITY / TYPE OF NATURAL FEATURE	#	Grimsby	West Lincoln	Wainfleet	Port Colborne	Pelham	Lincoln	St. Catharines	Thorold	Welland	Fort Erie	Niagara Falls	Niagara-on-the-Lake
Escarpment-related	13	2	-	-	-	1	5	1	1	-	-	4	4
MNR - Classified Wetlands	10	-	-	3	3	-	2	1	-	1	1	2	-
Additional Wetlands	10	-	1	-	-	1	-	1	2	1	-	1	3
Important Fisheries and Waterfowl Habitats	9	1	-	1	1	1	1	1	-	-	4	3	2
Woodlots	9	1	-	2	-	1	-	-	1	-	1	1	2
Forested Recreation Areas	2	-	1	-	-	-	-	-	-	-	1	-	-
Wet Forests	22	1	13	5	-	-	1	-	-	-	1	1	-
Unusual Landforms	6	-	-	-	3	-	-	-	-	-	3	-	-
Rare Flora and Fauna	9	-	-	-	-	1	-	-	1	-	3	2	2
TOTALS	90*	5	15	11	7	5	9	4	5	2	14	14	13

*Note: Certain areas occur in more than one municipality, since the limits of natural features are not necessarily coincident with the boundaries of municipalities. Therefore, the number of features in all municipalities exceeds the total number of features due to double counting.

This document brings together known sources of information on natural areas in the Niagara Region into one comprehensive source. Further work is needed to determine the relative importance of the natural areas. Some areas of local significance may not be included. However, natural areas that are considered of provincial and/or national significance are comprehensively surveyed. Following review by technical agencies and the public it may be desirable to recognize the natural features of this Region in municipal planning documents. This step would aid in the conservation, preservation, and responsible management of these natural areas.

The next step in protecting natural areas is the development of alternative environmental policies. One approach is to survey other jurisdictions and evaluate their methods.

GLOSSARY

ANSI = Area of Natural and Scientific Interest - an area of land or water containing natural landscapes or features that have values related to protection, natural heritage appreciation, scientific study or education; two types: life science and earth science (Ministry of Natural Resources).

Brock ESA Report = An environmentally sensitive area, designated by virtue of the natural feature satisfying at least four of nine criteria devised by Professor Paul Eagles of the University of Waterloo; briefly they are as follows:

1) distinctive and unusual landform;
2) ecological function such as water storage or recharge area, important wildlife stopover or concentration point, or habitat link between biological communities;
3) unusual or high quality plant and/or animal communities;
4) unusual habitat with limited representation, or small remnant of a habitat virtually disappeared;
5) unusually high diversity of biological communities;
6) habitat for rare or endangered indigenous species;
7) large potential habitat for species requiring expanses;
8) amenable to scientific research and conservation education purposes;
9) high aesthetic value where alteration results in loss of amenity.

These criteria have been used in several ESA studies in Southern Ontario.

Candidate nature reserve = A portion of a provincially significant ANSI selected to represent the natural features and landscapes of Ontario and complement other protected zones in the provincial park system; contains best examples of landform and vegetation features of each site district; possesses sufficient ecological integrity, buffering capacity and size that protection appears to be a viable management strategy (Ministry of Natural Resources).

Carolinan species/forest = A forested area possessing deciduous species more commonly found in southern climates such as the Carolina's; these species are often considered rare in Canada and Ontario; examples include American Chestnut, Black Gum, Big Shellbark Hickory, Hop-tree, Cucumber Magnolia, Red Mulberry, Black Oak, Pin Oak, Swamp White Oak, Pawpaw, Sasafras, Tulip-tree, and Black Walnut.

Earth Science Feature = Significant landform or geological exposure (Ministry of Natural Resources).

IBP site = A recognized conservation area for terrestrial biological communities identified by the International Biological Programme.

Life Science Feature = Significant vegetation pattern (Ministry of Natural Resources).

NEC escarpment natural area = Niagara Escarpment Commission-identified feature of the escarpment and associated stream valleys, wetlands and forests; relatively undisturbed important plant and animal habitats or naturally and scenically significant geological features; includes provincially significant ANSI's - Life Science, forest lands abutting and 1,000 feet from brow of escarpment slope, and the least disturbed slopes and related landforms associated with underlying bedrock.

Philips Report fragile and unique biological areas site = Abnormal varieties of flora, fauna or land-water combinations; irreplaceable laboratories for scientific research, reservoirs of natural materials, and habitats for plant and animal species.

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APPENDIX I

Natural Area Fact Sheets

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Niagara River Gorge (also includes Niagara Glen Park, Queen Victoria Park, and Dufferin Islands)

-Description
- .largest river gorge in Southern Ontario;
- .Niagara River, Horseshoe Falls, Whirlpool and Rapids;
- .most extensive Silurian exposure of its type in Southern Ontario;
- .best exposures in the Province of Neagha Formation, for geologic study.

-Location
- .eastern boundary of Niagara Region, running north-south;
- .Niagara Falls.

-Plan Designations
- .environmentally sensitive area, in Regional Niagara Policy Plan;
- .Conservation, in Niagara Falls Official Plan Amendment No. 29.

-Significance
- .Philips Report Site #25 of the Fragile and Unique Biological Areas (Niagara Glen) - only location of New Jersey Tea plant in Niagara Region;
- .Philips Report Site #26 of the Fragile and Unique Biological Areas (Dufferin Islands) - one of only two Canadian locations of the Butterbur plant, and many exotic tree species;
- .important wildlife area, according to the Niagara Peninsula Conservation Authority (NPCA);
- .important waterfowl area, according to the Ministry of Natural Resources (MNR) - known species include Whistling Swans, Mute Swan, Herring Gulls, Bonaparte Gulls, Common Goldeneye Ducks, Canvasback Ducks, Ringbilled Gulls, Scaup or Bluebill Ducks, Common Mergansers, Rock Doves, and Bufflehead Ducks;
- .provincially significant ANSI - Earth Science and Life Science (MNR);
  - -Niagara Glen is a unique Carolinian forest;
  - -Whirlpool Gorge is a distinctive, highly fossilized landform;
- .candidate nature reserve (MNR);
  - -rich, varied, highly significant vegetation pattern;
- .Brock ESA Report ESA NF-14 (Niagara Glen);
  - -from Sir Adam Beck Power Plants south to the Lower Bridge;
  - -rare tree associations;
  - -distinctive landform;
  - -natural habitat linkage between Niagara Falls and Lake Ontario;
  - -rare tree species include Black Walnut, Tulip Tree, Swamp White Oak, Canada Plum, and Eastern Flowering Dogwood.

Queenston Heights (also includes margin of land south of York Street, and old quarry to the west)

- Description
  - . Escarpment promonotory overlooking Gorge;
  - . original post-glacial location of Niagara Falls.
- Location
  - . eastern boundary of Niagara Region, running east-west;
  - . southern boundary of Niagara-on-the-Lake and Niagara Falls.
- Plan Designations
  - . escarpment natural area, in Niagara Escarpment Plan;
  - . environmentally sensitive area, in Regional Niagara Policy Plan;
  - . Conservation, in Niagara Falls Official Plan Amendment No. 29.
- Significance
  - . important wildlife area (NPCA);
  - . provincially significant ANSI - Earth Science (MNR);
  - . candidate nature reserve (MNR);
    - -margin of land south of York Street in Queenston exhibits the glacial era Lake Iroquois shoreline;
  - . locally significant earth science feature (MNR);
    - -old Queenston Quarry exposes the Gasport, DeCew, and Rochester formations for geologic study;
  - . Brock ESA Report ESA NL-03(Niagara Parkway);
    - -one of the most diverse forests in Niagara Region;
    - -rich in rare trees (Black Walnut, Sycamore, Chinquapin Oak, Black Oak) and vascular plants (Tall Deerberry, Smooth Sumac).

St. Davids (includes Fireman's Park, Mountain Road, and Dorchester Road)

- Description
  - forested strip of Escarpment, with a partially buried gorge and several ancient sand hills.
- Location
  - from Queenston in the east to Warner Road in the west;
  - Niagara-on-the-Lake and Niagara Falls.
- Plan Designations
  - escarpment natural area (north of Bevan Heights), in Niagara Escarpment Plan;
  - environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance
  - Philips Report site #18 (Mewburn Gorge) of the Fragile and Unique Biological Areas;
    - -only known Canadian location of Trillium Sessile;
    - -one of five of the Region's specimens of Tall Deer Berry, thought to be extirpated from Canada a century ago;
  - locally significant earth science features (MNR) at Mountain Road and at Dorchester Road in Niagara Falls;
    - -fossilized sand dunes and sand hills;
  - provincially significant ANSI - Earth Science (MNR);
    - -buried valley south of Highway 405;
  - candidate nature reserve (MNR) at Bevan Heights;
  - candidate nature reserve (MNR);
    - -Mewburn Gorge Slopes, including Fireman's Park;
  - IBP sites at Mountain Road Sand Hills and Dorchester Road Sand Plain in Niagara Falls;
  - Brock ESA Report ESA NL-01 (Fireman's Park/ St. Davids Waterworks);
    - -nature stands of Sassafras;
    - -large individual Tulip trees and Black Oak;
    - -other rare species to Canada include Black Walnut, Eastern Flowering Dogwood, Swamp White Oak, and Honey Locust;
    - -diverse vegetation community.

Woodend

- Description
  - . significant promonotory of the Homer section of the Escarpment.
- Location
  - . east of Taylor Road and west of QEW/405 interchange;
  - . Niagara-on-the-Lake and Niagara Falls.
- Plan Designations
  - . escarpment natural area, in Niagara Escarpment Plan;
  - . environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance
  - . Philips Report site #17 of the Fragile and Unique Biological Areas;
  - . conservation area, owned by Niagara Peninsula Conservation Authority;
  - . locally significant earth science feature (MNR)
    - -Woodend Outlier;
  - . regionally significant ANSI (MNR);
  - . Brock ESA Report ESA NL-04
    - -high diversity of vegetation species;
    - -species rare to Canada include Black Walnut, Pawpaw, and Red Mulberry.

Short Hills / Fonthill Kame (also includes Effingham and St. John's)

- Description
  - Fonthill Kame is a distinctive glacial landform with delta moraine deposits which dominates the landscape;
  - Short Hills is a provincial park comprised of a complex of glacially-formed hills cut with stream valleys, set within the Twelve Mile Creek re-entrant valley, eroded into the Escarpment by ancient rivers;
  - major tributaries of Twelve Mile Creek run through Effingham and St. John's;
  - St. John's valley may have the greatest diversity of plant species in all of Ontario.
- Location
  - Short Hills are in the north-east corner of Pelham and the western margins of Thorold;
  - Fonthill Kame is in the centre of Pelham.
- Plan Designations
  - escarpment natural area, in the Niagara Escarpment Plan
    - -Short Hills Provincial Park;
    - -Effingham and St. John's valleys;
    - -portions of the north-facing slope of Fonthill Kame;
  - environmentally sensitive area, in the Regional Niagara Policy Plan
    - -Short Hills Provincial Park;
    - -St. John's;
  - special rural, in Thorold Official Plan
    - -south-east portion of Short Hills;
  - special rural, in Pelham Official Plan
    - -south-west portion of Short Hills.
- Significance
  - Philips Report site #7 of the Fragile and Unique Biological Areas (Short Hills Wilderness Area)
    - -virgin deciduous forest;
    - -tallest Tulip Tree in Region;
  - Philips Report Site #10 of the Fragile and Unique Biological Areas (Site of Effingham Provincial Park)
    - -Pawpaw trees;
    - -Wahoo Bush, only location in Region;
  - Philips Report Site #51 of the Fragile and Unique Biological Areas (Reed's Bird Sanctuary);
  - conservation area at St. John's, owned by Niagara Peninsula Conservation Authority
    - -over 500 plant species, representative of bogs, valleys, and meadows;

-Canada Land Inventory Class 2 habitat capability for White-tailed Deer;
-temporary feeding and sanctuary area for Wood Ducks, Green-winged Teals, Mallard and Black Ducks, Green Herons, and Great Blue Herons;
-rare wildlife species include Spotted Salamander, Four-toed Salamander, Red-backed Salamander, Pickerel Frog, Opossum, and Carolina Wren;
-Twelve Mile Creek tributary is part of the only provincially signficant cold water stream fishery in the Region;
-spring-fed pond supports rainbow trout;
-rare plant species include Ginseng, Broad-beech Fern, Flowering Dogwood Eastern Hemlock, Black Walnut, Pignut Hickory, Shagbark Hickory, Swamp White Oak, Sassafras, and Tulip tree;

. important wildlife area (NPCA)
-deer, Opossum, Red Fox;

. provincially significant earth science feature (MNR)
-Twelve Mile Creek Re-entrant Valley;

. provincially significant ANSI (MNR) at Short Hills at Provincial Park;

. candidate nature reserves (MNR) within Short Hills ANSI at Twelve Mile Creek Re-entrant valley, Dry Falls, Terrace Creek, and McSherry Lane
-rare plant species include Shagbark Hickory, Pignut Hickory, Flowering Dogwood, Sassafras, Tulip tree, Cucumber tree, Sycamore, Eastern Hemlock, Showy Ladies Slipper, and Deer Berry;
-rare wildlife species include Yellow Warbler, Pileated Woodpecker, and Spotted turtle;
-wide variety of nesting, migrant and wintering birds, including Bobolinks, Brown Thrasher, Ruffed Grouse, pheasants and hawks;
-White-tailed Deer, Coyotes, Red Fox, and Meadow Voles are present;

. provincially significant ANSI-Earth Science (MNR) called Fonthill Kame Delta
-relic beach and bar deposits and lake terraces offer excellent geologic study opportunities;

. candidate nature reserve (MNR) called Fonthill Sandhill Valleys;

. Carolinian species/forest identified by Carolinian Canada Project (Fonthill Sandhill Valleys);
. IBP sites at St. John's Conservation Area and Short Hills Wilderness Area and Surrounding Woods (owned by Hamilton Naturalist Club)
  - almost unique examples of virgin Carolinian forest;
. Brock ESA Report ESA Pl-09 (Short Hills Provincial Park)
  -high quality biotic community as indicated by the large deer population and the large number of bird species;
  -unusually high diversity of biological communities due to the varying topography and geology;
. Brock ESA Report Pl-01 (Short Hills / St. John's)
  -significant for the same reasons as ESA Pl-09;
  -large size (260 hectares) provides a refuge for species requiring extensive and contiguous blocks of suitable habitat.

DeCew Falls (also includes DeCew Hydro and Burleigh Hill Road cuts, Sanitorium Hill, and Lake Moodie/Lake Gibson)

- Description
  - . waterfalls and gorge over Escarpment crest.
- Location
  - . along the Niagara Escarpment between the Welland Canals and Short Hills;
  - . Thorold (northern limits) and south of St. Catharines.
- Plan Designations
  - . escarpment natural area, in the Niagara Escarpment Plan (from just east of Burleigh Hill west to the Short Hills);
  - . environmentally sensitive area, in the Regional Niagara Policy Plan (between the Welland Canal and DeCew Hydro lands);
  - . environmental protection area, in St. Catharines Official Plan.
- Significance
  - . Philips Report site #13 of the Fragile and Unique Biological Areas;
  - . regional important warm water fishery (MNR) along middle and lower reaches of Twelve Mile Creek;
  - . provincially significant warm water fishery (MNR) at Lake Moodie/Lake Gibson;
    - -species include Rainbow Trout, Northern Pike, Yellow Perch, and Smallmouth Bass;
  - . locally significant earth science features (MNR) at Burleigh Hill and DeCew Hydro Road cuts;
  - . locally significant life science feature (MNR) at Sanitorium Hill;
  - . regionally significant ANSI - Earth Science (MNR);
    - -natural bedrock exposures of the DeCew Lockport, Rochester, Irondequoit, and Reynales formations;
  - . regionally significant ANSI - Life Science (MNR) west of Lake Moodie;
  - . provincially significant ANSI - Earth Science (MNR);
    - -DeCew Falls and Twelve Mile Creek Re-entrant Valley as part of the Short Hills Provincial Park Reserve ANSI;
  - . candiate nature reserve (MNR) called DeCew Falls Escarpment and Valley;
    - -diverse and representation terrace valley vegetation patterns;
  - . IBP site called DeCew Falls Floodplain;
    - -largest and purest stand of Pawpaw in the Niagara Peninsula;

. Brock ESA Report ESA SC-02
  -unusually high quality biological community;
  -unusually diverse woodland and aquatic communities;
  -good regeneration of rare Black Walnut.

Rockway

- Description
  . two cataracts (18.3 and 12.2 metres) and spectacular gorge below lower falls as Fifteen Mile Creek spills over the Escarpment.
- Location
  . south-east margin of Lincoln.
- Plan Designations
  . escarpment natural area, in Niagara Escarpment Plan (from the upper falls to the Lake Iroquois shoreline at Regional Road 81);
  . environmentally sensitive area, in Regional Niagara Policy Plan;
  . environmental protection area, in St. Catharines Official Plan (from the lower gorge to the edge of the terrace valley at Regional Road 81).
- Significance
  . conservation area, owned by Niagara Peninsula Conservation Authority
    -rare plant species include Eastern Hemlock, Black Walnut, Bitternut Hickory, Flowering Dogwood, Big Shellbark Hickory, Pignut Hickory, Swamp White Oak, Sycamore, Sassafras, American Bittersweet, Bladdernut, Virginia Creeper, Round-leaved Dogwood, American Fly Honeysuckle, Wild plum, Winter-creeper, Wood Anemone, Chickory, Columbine, Rattlesnake Fern, Wild leak, Spotted St. Johnswort, Twinleaf, Large-leaved Violet, Virginia Waterleaf, White Wild Licorice;
    -significant wildlife species include White-tailed deer, Red-tailed hawk, Scarlet Tanager, Black-billed Cuckoo, Ruffed Grouse, Red Fox, Eastern Belted Kingfisher, Red-headed Woodpecker;
  . provincially significant warm water fishery (MNR)
    -Fifteen Mile Creek, from the upper cataract at Rockway at Lake Ontario contains Large-mouth Bass, Yellow Pickerel, and Pumpkinseed;
  . regionally significant earth science feature (MNR)
    -Rockway Falls possesses a natural bedrock gorge exposure of rock units between the Lower Lockport and Upper Grimsby formations;
  . provincially significant ANSI-Life Science (MNR) called Fifteen Mile Creek Terrace Valley
    -extensive Whirlpool Terrace valley;
    -large incised forested valley;
    -slope, valley and basin forests of a variety of ages and various stages of succession;

- candidate nature reserve (MNR) as part of Short Hills Provincial Park Reserve ANSI;
- carolinian species/forest, identified by Carolinian Canada Project (Fifteen Mile Creek Terrace Valley);
- Brock ESA Report ESA Ln-03
  - -rare species include Pignut Hickory, Eastern Flowering Dogwood, and Canada Plum;
  - -significant wildlife species include deer and Ruffed Grouse;
  - -links other Escarpment and Lake Ontario Plain sites.

Louth

- Description
  - waterfalls of 3.66 and 7.92 metres and a terrace valley where Sixteen Mile Creek descends the Escarpment.
- Location
  - south Lincoln, at the Escarpment between Jordan and Beamsville.
- Plan Designation
  - escarpment natural area, in Niagara Escarpment Plan, from upper cataract to edge of terrace valley at Regional Road 81;
  - environmentally sensitive are, in Regional Niagara Policy Plan, from upper cataract to mouth of Sixteen Mile Creek.
- Significance
  - conservation area, owned by Niagara Peninsula Conservation Authority
    - -significant topographic features such as Escarpment rim plain, cliff faces, talus slopes, terraces, incised valleys, and unconsolidated till slopes;
    - -significant plant species include Black Walnut, Bitternut Hickory, Ironwood, American Basswood, and Trembling Aspen;
  - provincial significant warm water fishery (MNR)
    - -Sixteen Mile Creek from the upper cataract to Lake Ontario boasts Largemouth Bass, White Perch, Green Sunfish, and Pumpkinseed;
  - regionally significant earth science feature (MNR);
  - provincially significant ANSI - Life Science (MNR) called Sixteen Mile Creek Terrace Valley
    - -well-developed escarpment terrace valley extends from the partially buried escarpment face to the Lake Ontario Plain;
    - -extensive broad valley basin forest;
    - -well-developed bedrock exposures in the stream bed;
    - -valley forms a broad meander pattern in the Whirlpool Terrace south of Regional Road 81.
  - Carolinian species/forest, identified by Carolinian Canada Project;
  - Brock ESA Report ESA Ln-10 (Upper Rockway Escarpment)
    - -high quality, healthy and mature plant and animal community;
    - -diverse biological communities (upland forest, exposed bedrock scarp, successional margin).

Balls Falls

- Description . two waterfalls and a magnificent bedrock gorge where Twenty Mile Creek cascades over the Escarpment.

- Location . south of Jordan in central Lincoln.

- Plan Designation . escarpment natural area, in Niagara Escarpment Plan (from Seventh Avenue in the south, north to Jordan Harbour);
. environmentally sensitive area, in Regional Niagara Policy Plan.

- Significance . conservation area, owned by Niagara Peninsula Conservation Authority
  -upper cataract exposes the Lockport, DeCew, and Rochester formations;
  -lower cataract exposes the Irondoquoit, Reynales, Thorold, Grimsby, and Power Glen formations;
  -hardwood (Carolinian) forest of Hemlock, Eastern Cottonwood, Butternut, Black Walnut, Shagbark, Hickory, Slippery Elm, Tulip tree, American Beech, and Black Locust;
  -Burt Miller Arboretum includes Flowering Dogwood, Ironwood, Balsam, Canada and Allegheny Serviceberries, Sycamore, Sweet Gum, Bur Oak, Sassafras, Honey Locust, and Kentucky Coffee tree;
  -471 species of vascular plants including Wild Sarsaparilla, Green and White Trilliums, Wild Ginger, Wild Geranium, Virginia Bluebells, Canada Yew, Arrowhead, Wild Leek, Asparagus, Wild Yam, Red Mulberry, Wild Columbine, Canada Anemore, Choke-cherry, Virginia creeper, St. John's Wort, and Virginia Bluebell;
. provincially significant warm water fishery (MNR)
  -from upper cataract to Jordan Harbour, Twenty Mile Creek boasts Largemouth Bass, Yellow Perch, Grass Pickerel, Rock Bass, Green Sunfish, Creek Chub, and Pumpkinseed;
. provincially significant earth science feature (MNR) at Fly Road gravel pit;
. provincially significant ANSI - Life Science (MNR) called Jordan Escarpment Valley
  -excellent incised escarpment valley with escarpment terrace valleys and broad floodplain features;
  -Twenty Mile Creek cuts across the Vinemount moraine atop the escarpment plain;

-broad, valley mouth, floodplain basin forest (north to the CNR tracks) with well-developed annual alternate stream channelization or scree, towards drowned meander valley alluvial wetlands of the Jordan Harbour area;

- candidate nature reserve (CNR) at the gorge between the lower falls and Regional Road 81
  -bedrock exposure of the complete sequence of Silurian stratigraphy of the Niagara Peninsula;
- Carolinian species/forest, identified by Carolinian Canada Project (Jordan Valley);
- Brock ESA Report ESA Ln-06 (Vineland Escarpment)
  -unusually high diversity of vegetation species;
- Brock ESA Report ESA Ln-07 (Jordan Harbour / Ball's Falls)
  -habitat rare species include Sycamore, Sassafras and Pignut Hickory;
  -unusually high diversity of biological communities and associated plants and animals.

Beamer's Falls

- Description
  - . 23 metre cataract where Forty Mile Creek flows over the Escarpment.
- Location
  - . north-central Grimsby.
- Plan Designation
  - . escarpment natural area, in Niagara Escarpment Plan;
  - . environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance
  - . conservation area, owned by Niagara Peninsula Conservation Authority
    - -rare plant species include Black Walnut, Bitternut Hickory, Ironwood, Trembling Aspen, and American Basswood;
    - -rare reptiles include Spring Salamander, Northern Dusky Salamander, and Massassauga Rattlesnake;
  - . locally significant earth science feature (MNR) at Woolverton Mountain Road cut;
  - . regionally significant earth science feature (MNR)
    - -Beamer Falls bedrock gorge possesses good exposures of rock units from the Lockport to Grimsby formations;
  - . regionally significant ANSI (MNR) called Beamer Valley and Grimsby Escarpment
    - -only example of escarpment rim or foot plain forests;
    - -rare, active and open scree slope towards the Forty Mile Creek valley mouth;
  - . provincially significant ANSI - Life Science (MNR) called Niagara Section Escarpment;
  - . Brock ESA Report ESA Gr-07 (Grimsby Escarpment)
    - -many geological features, including steep slopes, plateau, re-entrant streams, V-shaped gorges, rock outcroppings, and sandstone cliffs;
    - -rare species include Hemlock, Shagbark Hickory, Swamp White Oak, Slippery Elm, American Beech, and Basswood.

Cave Springs

- Description
  - thick, dense forest on the brow of the Escarpment;
  - scarp face and talus slope are exposed;
  - rare plant species include Basswood, Butternut, Slippery Elm, Ironwood, Black Locust, Canada Anemone, Trillium, Virginia Waterleaf, Wild Sarsaparilla, Virginia Creeper, and Ginseng.
- Location
  - south-east of Beamsville in Lincoln.
- Plan Designation
  - escarpment natural area, in Niagara Escarpment Plan;
  - environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance
  - conservation area, owned by Niagara Peninsula Conservation Authority;
  - regionally significant earth science feature (MNR) at Cave Springs Farm
    - -extensive crevassing of Lockport dolomite cap rock along joints;
    - -good example of post-glacial and possibly peri-glacial crevasse development upon the Niagara Escarpment;
  - regionally significant ANSI - Earth Science (MNR) called South Beamsville Slope
    - -located at Kinsmen Park, Lots 17 to 19 of Concession V, Beamsville;
  - provincially significant ANSI - Life Science (MNR) called Beamsville Escarpment
    - -six metre limestone cliff promonotory;
    - -series of crevasse valleys on east side;
    - -forested escarpment plain, face, foot slope, and till valley on west side;
  - candidate nature reserve (MNR);
  - IBP site
    - -one of the least disturbed sections of the southern Niagara Escarpment;
    - -rare species include Basswood, Butternut, Wild Columbine, and Ginseng;
  - Brock ESA Report ESA Ln-06 (Vineland Escarpment)
    - -rare species include Black Walnut.

Mountainview (also includes Thirty Mile Creek)

- Description
  . escarpment area, exhibiting combinations of sandstone cliffs, terraces, and ravines.
- Location
  . western margin of Lincoln at Grimsby.
- Plan Designations
  . escarpment natural area, in Niagara Escarpment Plan;
  . environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance
  . conservation area, owned by Niagara Peninsula Conservation Authority;
  . regionally significant ANSI - Earth Science (MNR) called Mountainview-Valentino Escarpment Terrace, Thirty Mile Creek Terrace Valley, and Grimsby Brock Terrace Valley;
  . Brock ESA Report ESA Ln-05 (Beamsville Escarpment)
    -rare species include Pignut Hickory.

Woolverton

- Description
  . a narrow strip of forest on the brim of the Escarpment.
- Location
  . east to west from Woolverton Mountain Road in Grimsby to the boundary with Stoney Creek (Hamilton-Wentworth).
- Plan Designations
  . escarpment natural area, in Niagara Escarpment Plan;
  . environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance
  . conservation area, leased from Ontario Hydro by Niagara Peninsula Conservation Authority;
  . provincially significant ANSI - Life Science (MNR) called Winona Escarpment;
  . Carolinian species/forest, identified by Carolinian Canada Project (Grimsby Escarpment);
  . Brock ESA Report ESA Gr-07 (Grimsby Escarpment).

MNR - Classified Wetlands: Page

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Wainfleet Marsh

- Description
  - largest wetland (1,526.4 hectares) in Niagara Region;
  - 40% bog, 31.5 % swamp, 27% fen, 15% marsh;
  - more than one-third has been lost to peat extraction and agricultural activities;
  - accommodates endangered and nearly extirpated wildlife species such as Four-toed Salamander, Newt, Chorus Frog, Leopard Frog, Wood Frog, Midland Painted turtle, Blanding's Turtle, Spotted Turtle, Water snake, Ribbon snake, Ring-necked snake, Red-bellied snake, Black Rat snake, Massassauga rattlesnake, Short-eared Owls, hawks, deer, Muskrat, Red Fox, Brush Wolf, and possibly Bobcat;
  - active feeding ground for colonial waterbirds, and is last nesting area in Niagara of the American Bittern;
  - rare plant species include Pitcher-plant, Lance-leaved Violet, Virginia Chain Fern, Stag-horned Club Moss, Trembling Aspen, Bristly Sarsparilla, and Grey Birch;
  - biological communities continue to be disturbed by burning and water drainage

- Location
  - south-east quarter of Wainfleet and small north-west portion of Port Colborne.

- Plan Designations
  - environmentally sensitive area, in Regional Niagara Policy Plan;
  - environmentally sensitive area in Wainfleet Official Plan Amendment No. 6 (unapproved)
    -north-east quarter only;
  - environmentally sensitive area- in Port Colborne Official Plan.

- Significance
  - Philips Report site #40 of the Fragile and Unique Biological Areas;
  - important wildlife area, according to Niagara Peninsula Conservation Authority
    -waterfowl, Muskrat, deer, fox;
  - highest quality wetland (Class 1, rank 1) in Niagara Region (MNR)
    -largest bog east of Grand River;
    -Mink, Star-nosed Mole, Coyote, Ring-necked Pheasant, Long- and Short-billed Marsh Wren, Pin Tail and Shoveler Duck, Mallard and Black Ducks are among the significant wildlife present;

- provincially significant ANSI - Life Science (MNR), originally to the fullest modern extent of the bog, but recently delineated only to the extent of the candidate nature reserve;
- candidate nature reserve (MNR)
  - -Wainfleet Peat Basin Heath, approximately covered by the local ESA designations, qualifies for high priority protection because it does not occur elsewhere in MNR Site District 7-2;
  - -marshy wetlands and wet peat bog communities;
  - -series of zones of successional forest and scrub communities;
  - -only recorded sphagnous peat basin landform south of Luther Lake (in north-east Wellington County) that supports a peatland circaceous heath community;
  - -Humberstone and Willoughby marshes have achieved a later successional stage of muck deposits overlying original peat and deciduous swamp forests developing;
- IBP site (Wainfleet Marsh and Peat Bog);
- Brock ESA Report ESA Wf-13 (Wainfleet Bog)
  - -rare plant species include Swamp White Oak, Chinquapin Oak, Bur Oak, Pin Oak, and Shagbark Hickory.

Wainfleet Wetlands

- Description
  - wetland complex formed from limestone quarries and clay ponds, separated by meadow and forested areas;
  - Eagle Marsh Drain forms part of the southern margin;
  - rare species amongst the clay pits include Basswood, Ironwood, Bur Oak, Pignut and Shagbark Hickory, Black Walnut, and Flowering Dogwood;
  - rare plants amongst the wet scrubland include Ginseng, Arrowwood, Hawthorn, Choke-cherry, and Red Mulberry.
  - hardwood forest north of Cement Road boasts White and Red Mulberry, Ginseng, Shagbark Hickory, Hawthorn, Choke-cherry, Flowering Dogwood, Arrowwood, and Staghorn Sumac;
  - significant wildlife includes White-tailed Deer, Muskrat, Red Fox, Rock Doves, Marsh Hawk, Green Heron and Great Blue Heron, Midland Painted and Snapping Turtles, Spotted Turtle, and Leopard Frog;
  - fish species present include Northern Pike, Smallmouth and Largemouth Bass, Rock Bass, Yellow Perch, Sunfish, Bluegill, Brown and Yellow Bullhead, Pumpkinseed, White and Black Crappie.
- Location
  - south-east Wainfleet.
- Plan Designation
  - environemtnally sensitive area, in Regional Niagara Policy Plan.
- Significance
  - Philips Report site #49 of the Fragile and Unique Biological Areas (Quarry Wetlands - Port Colborne, west side of Cement Road);
  - conservation area, owned by Niagara Peninsula Conservation Authority
    - -limestone quarries are highly fossilized with unequalled structural features, with rock formation exposures that cannot be viewed satisfactorily elsewhere in the Province;
  - regionally significant warm water fishery (NPCA), along Eagle Marsh Drain south of Highway 3;
  - important wildlife area (NPCA)
    - -White-tailed deer, Muskrat, fox, Egrets, ducks;
  - Brock ESA Report ESA Wf-22.

Lyons Creek Wetlands

- Description
  - . 150.5 hectare linear riverine marsh, though severely polluted, provides excellent waterfowl habitat;
  - . significant fish species present include Northern Pike, Yellow Perch, Rock Bass, Black Crappie, Brown Bullhead, Creek Chub, and Pumpkinseed;
  - . significant avian species present include Green and Great Blue Heron, American Bittern, Mallard and Black Ducks, Blue-winged Teal, Sharp-shinned and Sparrow Hawks, Red-tailed Hawk, Ruffed Grouse, Ring-necked Pheasant, Spotted Sandpiper, Short-eared Owl, Hummingbird, Rose-breated and Evening Grosbeak, Eastern Kingbird, Downy and Hairy Woodpeckers, Red-headed Woodpecker, and Wood Duck;
  - . significant wildlife include Star-nosed Mole, Mink, Red and Grey Fox, Long-tailed Weasel.
- Location
  - . south-west Niagara Falls and south-east Welland.
- Plan Designation
  - . environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance
  - . Philips Report Site #32 of the Fragile and Unique Biological Areas
    - -great concentrations of autumn roosting areas for Wood Duck;
    - -Black-crowned Night Herons and Marsh Wrens;
  - . Class 1 wetland (MNR)
    - -significant species present include Red-shouldered Hawks and Turkey Vultures;
  - . regionally significant life science feature (MNR)
    - -best interior wetland community development in the Region for an incised meander stream basin.

Willoughby Marsh

- Description
  - . 363 hectare swamp which forms the headwaters for Black, Tee, and Usshers Creeks, and provides excellent game and nesting bird cover.
- Location
  - . south Niagara Falls.
- Plan Designation
  - . environmentally sensitive area, in Regional Niagara Policy Plan;
  - . conservation, in Niagara Falls Official Plan Amendment No. 29.
- Significance
  - . Philips Report Site #48 of the Fragile and Unique Biological Areas;
  - . conservation area, owned by Niagara Peninsula Conservation Authority
    - -significant wildlife species present include White-tailed Deer, Red Fox, Snapping Turtles, Muskrat, Opossum, Weasel, Pickerel Frog, and Spotted Salamander;
    - -significant bird species present include Green and Great Blue Heron, Mallards, Marsh and Sparrow Hawks, Red-tailed Hawks, Ruffed Grouse, Great Horned Owl, Downy and Hairy Woodpeckers, Red-headed Woodpecker, Scarlet Tanager, Evening and Rose-breasted Grosbeaks, Prothonotary Warbler, Rufous-sided Towhee, Black-billed Cuckoo, and Turkey Vulture;
  - . wildlife management area (MNR);
  - . Class 1 wetland (MNR);
    - -good productivity value because of water's good nutrient status;
    - -diversity value low because there is little open water;
    - -great number of vegetation communities though the interspersion value is low because deciduous vegetation dominates;
  - . provincially significant ANSI - Life Science (MNR) and candidate nature reserve (MNR) called Willoughby Clay Plain Muck Basin Forest
    - -qualifies for top priority protection because it does not occur elsewhere in the Site Region;
    - -series of broad wet basins supporting a variety of swamp forests, scrub and marsh communities;
    - -regionally significant characteristic vegetation patterns and biota of an extensive slough patterned heavy clay plain forested area;

- Carolinian species/forest, identified by Carolinian Canada Project;
- Brock ESA Report ESA NF-11
  - -rare plant species include Swamp White Oak, Pin Oak, Slippery Elm, Pignut Hickory, Shagbark Hickory, Arrowhead, Trembling Aspen;
  - -significant wildlife species include Bobolink, Red-tailed Hawk, and Great Blue Heron.

Fifteen Mile Creek Estuary (also includes "drowned" Sixteen Mile Creek mouth)

- Description
  - 23 hectare wetland (marsh) complex where Fifteen and Sixteen Mile Creeks meet Lake Ontario;
  - high quality examples of Lake Ontario plain marsh and drowned valley bottomland forest;
  - prime nesting and rearing area for Mallard, Wood Duck, and Blue-winged Teal;
  - offshore and important feeding and resting area for fall migrations of Diving Ducks, especially Goldeneyes, Buffleheads, and Oldsquaws.
- Location
  - north-east corner of Lincoln and western limits of St. Catharines.
- Plan Designations
  - environmentally sensitive area, in Regional Niagara Policy Plan;
  - environmental protection area, in St. Catharines Official Plan (Fifteen Mile Creek estuary).
- Significance
  - Philips Report site #11 of the Fragile and Unique Biological Areas (Fifteen and Sixteen Mile Creek Ponds);
  - Philips Report site #12 of the Fragile and Unique Biological Areas (East Bank of Fifteen Mile Creek)
    - -only known Canadian station of Cherry Birch;
  - important wildlife area (NPCA)
    - -waterfowl, muskrat, deer, fox;
  - provincially significant warm water stream fisheries (MNR), Fifteen and Sixteen Mile Creeks from the Escarpment north to Lake Ontario;
  - Class 2 Wetland (MNR)
    - -Snapping Turtles, Bullfrogs, and Black Rat Snake are present;
    - -fair diversity of vegetation communities;
    - -excellent size and productivity values;
  - provincially significant ANSI - Earth Science (MNR) called Drowned Fifteen and Sixteen Mile Creek Mouth (which includes Seventeen Mile Creek mouth);
  - candidate nature reserve (MNR) called Fifteen Mile and Sixteen Mile Creek Valleys
    - -moderate quality shoreline bar, recent meander valley, and sandland forest;
    - -high quality shoreline marsh, drowned valley, drowned valley slope, bottomland forest, and overall representation;

- Carolinian species/forest, identified by Carolinian Project;
- Brock ESA Report ESA Ln-02
  - -flooded river valleys forming harbours, meandering valleys with both steep-sided slopes and meander floodplains, and shallow ponds and bluffs;
  - -rare plant species include Black Walnut, Pin Oak, Hemlock, Sassafras, Dogwood, Black Locust, Cherry Birch, and Pignut Hickory.

Humberstone Marsh

- Description
  - one of only three occurrences of a peat- and muck-filled basin in the Haldimand Clay Plain;
  - Mallards, Black Ducks, and Ring-necked Pheasants are present;
  - 180 hectares.
- Location
  - east Port Colborne.
- Plan Designations
  - environmentally sensitive area, in Regional Niagara Policy Plan;
  - environmentally sensitive area, in Port Colborne Official Plan (north half of Lots 5 and 6, Concession III, west side of Wilhelm Road).
- Significance
  - Philips Report site #47 of the Fragile and Unique Biological Areas;
  - conservation area, owned by Niagara Peninsula Conservation Authority
    - -headwater discharge area for Black Creek;
  - important wildlife area (NPCA)
    - -White-tailed Deer, Red Fox, Muskrat, Opossum, Weasel, Pickerel Frog, and Spotted Salamander;
  - Class 2 wetland (MNR);
  - provincially significant ANSI - Life Science (MNR) called Humberstone Muck Basin Swamp Forest;
  - carolinian species/forest, identified by Carolinian Canada Project;
  - Brock ESA Report ESA PC-03
    - -rare plant species include Pin Oak, Shagbark Hickory, Slippery Elm, Trembling Aspen, Eastern Flowering Dogwood, and Swamp White Oak;
    - -381 hectares of contiguous forest and marsh makes it suitable for the survival of extensive habitat wildlife.

Twenty Mile Creek Estuary (also includes Jordan Harbour)

- Description
  - excellent, large (57 hectares) example of Lake Ontario plain marsh;
  - Twenty Mile Creek meets Lake Ontario;
  - steep sides of Jordan Harbour expose ancient Lake Iroquois lacustrine sand deposits.
- Location
  - north Lincoln.
- Plan Designations
  - environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance
  - Class 2 wetland (MNR)
    - -Bullfrogs, Snapping Turtles, Muskrat, Black Tern, and Marsh Wren presents;
    - -active feeding area for colonial waterbirds;
    - -fish spawning and rearing;
    - -relatively low diversity value because of limited numbers of vegetation species and their interspersion in marsh wetland;
  - provincially significant warm water fishery (MNR), along Twenty Mile Creek from Ball's Falls to Lake Ontario;
  - provincially significant ANSI - Life Science (MNR) called Twenty Mile Creek Drowned River Mouth;
  - candidate nature reserve (MNR) called Jordan Harbour Marsh
    - -large baymouth bar;
    - -wetlands vegetation unique to Niagara and similar to Cootes Paradise in Hamilton;
    - -drowned meander valley alluvial wetlands constitutes the largest single drowned misfit stream in the Peninsula;
    - -upper reaches of valley possess a large alluvial plain with well-developed levee patterns;
  - Brock ESA Report ESA Ln-07 (Jordan Harbour / Ball's Falls)
    - -rare plant species include Eastern Hemlock, and Pignut and Shagbark Hickory.

Point Abino Wetlands

- Description
  - . 153 hectares of swamp dominating north half of Point Abino peninsula;
  - . associated with Lake Erie, but land-locked by dune formations.
- Location
  - . south-west Fort Erie.
- Plan Designations
  - . environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance
  - . Philips Report site #48 of the Fragile and Unique Biological Areas
    - -spring migrant Diving Ducks, Acadian Flycatchers, and Carolina Wrens are present;
  - . Class 2 wetland (MNR)
    - -mature trees cover over half the area;
    - -significant wildlife species include Bullfrogs, Muskrat, Mink, Fox, Virginia Opossum, American Coot, and Black Tern;
    - -fairly high productivity value because of water's good nutrient status;
  - . IBP site on Dr. Marcy's property on the north-west quarter of the peninsula
    - -Eastern Hemlock, Choke-cherry, Tulip Tree, Butternut, Crested Wood Fern, and Hop Tree are among the rare species;
    - -excellent, almost pure stand of Yellow Birch (usually found further north) with an understory of hemlock;
  - . Brock ESA Report ESA FE-11
    - -rare species include Swamp White Oak, Slippery Elm, Eastern Flowering Dogwood, Black Walnut, Shagbark and Bitternut Hickory.

Mud Lake

- Description
  - man-made depression created when fourth Welland Canal was being excavated in 1921;
  - 52% swamp, 48% marsh;
  - waterfowl refuge and nesting site for many of the following: Blue- and Green-winged Teal, Mallard, Wood and Ruddy Ducks, Pied-billed Grebes, American Bitterns, Black Tern, American Coot, Long-billed Marsh Wren, Common Egret, Black and Ring-necked Ducks, Common Goldeneye, Bufflehead, Surf Scoter, Spotted Sandpiper, Downy Woodpecker, Rufous-sided Towhee, Marsh Hawk, Red-tailed and Cooper's Hawks.
- Location
  - Port Colborne, just west of Welland Canal.
- Plan Designation
  - environmentally sensitive area, in Regional Niagara Policy Plan;
  - environmentally sensitive area, in Port Colborne Official Plan.
- Significance
  - Philips Report site #39 of the Fragile and Unique Biological Areas
    - -nesting sites for Pied-billed Grebes, Coots, Least Bitterns, Virginia Rails, Soras, Gallinules, and various duck species;
    - -only known location in Niagara Region of Bog Twayblade Orchid and Nodding Ladies' Tresses;
  - wildlife management area (MNR);
  - Class 3 wetland (MNR)
    - -active feeding area for colonial waterbirds
  - Brock ESA Report ESA Wf-13 (Wainfleet Bog)
    - -rare species include Slippery Elm, Choke-cherry, Pin and Bur Oaks, Staghorn Sumac, Chinquopin Oak, and Shagbark Hickory.

Moulton East Wetland (also known as Bunz Bush)

- Description . 70.2 hectare wetland (swamp) complex of separate wooded areas.
- Location . western margin of Wainfleet, and into Moulton Township of Haldimand-Norfolk.
- Plan Designations . none.
- Significance . Class 4 wetland (MNR)
  - -fairly high productivity value due to water's good nutrient studies;
  - -low diversity value because of forested swamp predominance;
  - -regionally significant deer population;
  - -active feeding area for Great Blue Heron;
  - -other wildlife species include Grouse, Rose-breasted Grosbeak, bullfrogs, fox, Muskrat, Mink, and Virginia Opossum.

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Port Robinson Duck Ponds

- Description . a wetland complex of large ponds and swamp forest on the site of an old Welland Canal excavation.
- Location . west of the Canal, north of Port Robinson Road in Thorold.
- Plan Designation . none.
- Significance . Philips Report site #31 of the Fragile and Unique Biological Areas
  -inhabited by Wood Ducks, hawks and owls;
  . Brock ESA Report ESA Th-02
  -rare species include Pin Oak, Shagbark Hickory, and Eastern Flowering Dogwood.

Ridgeville Swamp

- Description . 13.76 hectares of wet (Tamarack) forest amidst rolling sand hills.
- Location . south-west slope of Fonthill Kame in Pelham.
- Plan Designations . none.
- Significance . part of Short Hills Dissected (Fonthill) Delta Kame Complex ANSI;
  . IBP site
  -rate species include Poison Sumac, Pignut Hickory, and Tulip Tree.

Virgil Dams

- Description . 1.4 hectare marshland created by the streamflow augmentation program for Four Mile Creek, surrounded by six hectares of coniferous reforestation and a one hectare experimental planting of exotic species known as Niagara Nut Grove.

- Location . south of Virgil in Niagara-on-the-Lake.

- Plan Designation . environmentally sensitive area, in Regional Niagara Policy Plan.

- Significance . conservation area, owned by Niagara Peninsula Conservation Authority
  -Niagara Nut Grove contains the following species: Black Walnut, Persian Walnut, Heartnut, Butternut, Filbert, Hazel, Chinese Chestnut, American Chestnut, Apricot, Shagbark Hickory, Shellbark Hickory;
  . regionally significant warm water fishery (MNR)
  -Four Mile Creek near Virgil boasts Northern Pike, Brown Bullhead, and Pumpkinseed among its sport fish species.

Two- and Four-Mile Creek Mouth

- Description
  - . small wetland surrounded by plain forest with Canada Land Inventory Class 2 habitat capability for White-Tailed Deer;
  - . Lake Ontario shoreline has alternating sandy beach and five metre clay bluffs.
- Location
  - . northern limits of Niagara-on-the-Lake.
- Plan Designations
  - . environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance
  - . Philips Report site #20 of the Fragile and Unique Biological Areas (Four Mile Creek Outlet)
    - -one of only three Canadian locations of Black Snake Root;
    - -last known regional location of Bird's Foot Violet;
  - . conservation area, leased by Niagara Peninsula Conservation Authority from Parks Canada (Niagara Shores)
    - -Four Mile Pond is inhabited by Wood Ducks, Spotted Sandpipers, Green and Great Blue Herons, Muskrats, Painted Turtles, Leopard Frog, and Bullfrogs;
    - -rare plant species include Sassafras, Pignut Hickory Black and Pin Oak, Swamp White Oak, Black Walnut, Slippery Elm, Eastern Flowering Dogwood, Shagbark Hickory, Honey Locust, White Trillium, Canada Anemone, Agrimony, and Virginia Creeper;
  - . candidate nature reserve (MNR)
    - -high quality Lake Ontario plain clayland prairie pattern and moderate quality Lake Ontario plain clayland forest;
    - -well-developed, highly significant vegetation patterns with distinct biotic communities;
  - . IBP site (Two Mile Creek Clay Plain);
  - . Brock ESA Report ESA NL-06 (Two Mile and Four Mile Creek).

Shriner's Creek

- Description . low quality riverine marsh created from a truncated stream.
- Location . north-west Niagara Falls.
- Plan Designations . environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance . owned by Niagara Peninsula Conservation Authority for water management purposes
  - -impoverished fish population, with some Northern and Grass Pike;
  - -creek is slow, meandering, turbid, with degrading channel and water quality impairment;
  - -significant wildlife includes White-tailed Deer, Coyote, Red Fox, Muskrat, Mallards, Blue- and Green-winged Teals, Great-horned Owls, Red-tailed and Sparrow Hawks.

Welland River (between Welland Canal / Chippawa Power Canal and the Queen Elizabeth Way)

- Description . truncated stream.
- Location . Niagara Falls, and Welland/Thorold boundary.
- Plan Designation . environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance . potential Class 1 or 2 wetland (MNR).

McNab Marsh

- Description . small wetland at the mouth of Eight Mile Creek.
- Location . north-west limits of Niagara-on-the-Lake.
- Plan Designations . none.
- Significance . candidate nature reserve (MNR)
  -small example of Lake Ontario plain marsh;
  -fair quality forest on fringes.

Allanburg Weir Swamp

- Description . small wetland created when the natural drainage pattern was interrupted by the Welland Canal.
- Location . west side of the Canal at Allanburg, Thorold.
- Plan Designation . none.
- Significance . Philips Report site #15 of the Fragile and Unique Biological Areas
  -nesting area for waterfowl and other birds.

Martindale Pond

- Description . Twelve Mile Creek riverine marsh.
- Location . near Lake Ontario in Port Dalhousie area of St. Catharines.
- Plan Designations . environmental protection area, in St. Catharines Official Plan.
- Significance . regionally significant warm water fishery (MNR, NPCA), Twelve Mile Creek below the Escarpment
  -Northern Pike, Yellow Perch, White and Black Crappie, Pumpkinseed, and Brown Bullhead;
  . important wildlife area (NPCA);
  . Brock ESA Report ESA SC-01
  -rare species include Shagbark Hickory, and Tulip Tree.

South Ste. Anns Slough Forest (also see Silverdale Woodlot in Wet Forests section of Appendix I)

- Description . extensive (300 hectares) contiguous wet forest.
- Location . north and east of Highway 20 at Bismark, West Lincoln.
- Plan Designations . none.
- Significance . potential Class 2 wetland (MNR)
  -headwaters for more than twenty tributaries of Sixteen Mile Creek and the Welland River.

Important Fisheries and Waterfowl Habitats: Page

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Lake Erie

- Designation
  - . continuous shoreline and offshore.
- Location
  - . from the Niagara River to the Haldimand-Norfolk boundary;
  - . Fort Erie, Port Colborne, Wainfleet southern margins.
- Plan Designation
  - . shoreline policy area, in Regional Niagara Policy Plan.
- Significance
  - . important wildlife area (NPCA)
    - -waterfowl, shorebirds;
  - . important waterfowl habitat (MNR)
    - -between Port Colborne and Dunnville, Canada Goose, Black Duck, Greater Scoup, Common Goldeneye, Bufflehead, Common and Red-breasted Merganser are present;
    - -from Port Colborne to the Niagara River, all of the above species are present, as well as Horned Grebe, Common Loon, Mallard, Red-head Duck, Ring-necked and Canvas-back Duck, Lesser Scoup, Oldsquaw, and Black Scoter;
  - . provincially significant warm water fishery (MNR)
    - -Smallmouth Bass, Yellow Perch, Yellow Pickerel, and Northern Pike are abundant;
    - -near Rock Island, off Long Beach, there is a significant Smallmouth Bass spawning, nursery and feeding area.

Niagara River

- Description
  - . swift current, cold water river.
- Location
  - . from Fort Erie to Niagara-on-the-Lake;
  - . eastern margins of Fort Erie, Niagara Falls, and Niagara-on-the-Lake.
- Plan Designation
  - . Conservation, in Niagara Falls Official Plan Amendment No. 29 (Niagara River Parkway).
- Significance
  - . important wildlife area (NPCA)
    - -waterfowl, shorebirds;
  - . important waterfowl habitat (MNR)
    - -above/south of Niagara Falls, Horned Grebe, Mute Swan, Mallard and Black Ducks, Canada Goose, Gadwall, Pintail, American Wigeon, Canvasback Duck, Greater Scoup, Bufflehead, Common Goldeneye, Common and Read-breasted Merganser are present;
    - -north of Queenston, in addition to the species listed above, there are Red-throated Loon, Lesser Scoup, Oldsquaw, White-winged Scoter, and Hooded Merganser;
  - . provincially significant cold and warm water fishery (MNR)
    - -significant species include Muskellunge, Chinook and Coho Salmon, Rainbow and Brown Trout, Northern Pike, Smallmouth and Largemouth Bass, Pickerel, Sturgeon, Lake Trout, and Yellow Perch.

Lake Ontario

- Description . continuous shoreline and offshore.

- Location . Niagara River to Haldimand-Norfolk boundary;
. Niagara-on-the-Lake, St. Catharines, Lincoln, and Grimsby's northern margins.

- Plan Designation . shoreline policy area, in Regional Niagara Policy Plan.

- Significance . important wildlife area (NPCA)
-waterfowl, shorebirds;
. important waterfowl habitat (MNR)
-from Fifty Point in Grimsby to Port Weller in St. Catharines, there are Mallard and Black Ducks, Greater Scoup, Common Goldeneye, Bufflehead, Oldsquaw, White-winged Scoter, Common Merganser, Hooded and Red-breasted Merganser;
-from Port Weller to the Niagara River, an addition to the species listed above, Red-throated Loon, Horned Grebe, Gadwall, American Wigeon, Canvasback Duck, and Lesser Scoup are present;
. provincially significant cold and warm water fishery
-Chinook and Coho Salmon, Rainbow Trout, Lake Trout, Brown Trout, Smallmouth and Largemouth Bass, Pickerel, Yellow Perch, and Northern Pike.

Bayer's, Ussher's, Black, Miller, and Frenchman Creeks

- Description . watercourses, from western sources east to the Niagara River.

- Location . Niagara Falls (Ussher's and Bayer's Creek), Fort Erie (Black, Miller, and Frenchman Creek).

- Plan Designation . environmentally sensitive are (Ussher's Creek Mouth, Black Creek), in Regional Niagara Policy Plan.

- Significance
  - . Philips Report site #29 of the Fragile and Unique Biological Areas
    - -Ussher's Creek Mouth is a location of the rare Green Arrow Arum plant;
  - . Philips Report site #30 of the Fragile and Unique Biological Areas
    - -near Ussher's Creek Mouth is a specimen of the rare Big Shellbark Hickory;
  - . provincially significant warm water fishery (MNR)
    - -lower reaches of Bayer's, Ussher's, Black, Miller and Frenchman Creek;
    - -significant fish species of Frenchman's Creek include Grass Pickerel, Creek Chub, Pumpkinseed, and Brown Bullhead;
    - -significant fish species of Bayer's Creek include Pumpkinseed, White Crappie, Black and Brown Bullhead;
    - -significant fish species of Miller Creek include Yellow Perch, Rock Bass, Grass Pickerel, Pumpkinseed, and Black Bullhead;
    - -significant fish species of Black Creek include all of those listed above, plus Northern Pike, Largemouth Bass, and Yellow Pickerel;
  - . IBP site (Miller Creek)
    - -location of a specimen of the rare Kingnut Hickory Tree.

Twelve Mile Creek

- Description
  - two tributaries (St. John's, and Effingham's two branches) of the upper reaches of Twelve Mile Creek constitute the only cold water stream fishery in the Niagara Region.
- Location
  - Short Hills, from spring-fed sources on the north slopes of the Fonthill Kame running north to DeCew Falls;
  - north half of Pelham, and south-west margin of St. Catharines.
- Plan Designations
  - environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance
  - provincially significant cold water fishery (MNR)
    -Rainbow and Brook Trout.

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Summer Street Woodlot

- Description
  - high quality deciduous woodlot with several Carolinian species;
  - 134 hectares.
- Location
  - south of Netherby Road, north-east of the Queen Elizabeth Way;
  - Fort Erie.
- Plan Designations
  - none.
- Significance
  - Brock ESA Report ESA FE-05
    - -drained by Miller and Baker Creeks;
    - -large deer population;
    - -rare plant species include Swamp White and Pin Oak, Bitternut and Shagbark Hickory, Slippery Elm.

Zuk's Zone

- Description
  - three hectare, high quality, Lake Ontario plain forest.
- Location
  - between St. Davids and Queenston in Niagara-on-the-Lake.
- Plan Designations
  - none.
- Significance
  - Brock ESA Report ESA NL-05
    - -nesting area for Great-horned Owls and Red-tailed Hawks;
    - -high species diversity of woody plants;
    - -rare plant species include Swamp White and Pin Oak, Sassafras, Black Walnut, Black Gum, Sycamore, Pawpaw, Black Locust, Big Shellbark Hickory, and Tulip Tree.

Paradise Grove

- Description . small, high quality example of Lake Ontario plain forest.
- Location . south-west of Fort George in Niagara-on-the-Lake.
- Plan Designation . none.
- Significance . Philips Report site #23 of the Fragile and Unique Biological Areas
  - -several significant relict prairie grasses and shoreline plant species;
  - -significant plant species include Forestweed, Fern-leaved False Foxglove, and Slender Ladies' Tresses Orchids;
  - -nesting place of Red-headed Woodpeckers.

Rice and Merritt Road Woodlot

- Description . small, high quality woodlot.
- Location . Pelham, south of Highway 20.
- Plan Designations . none.
- Significance . Philips Report site #9 of the Fragile and Unique Biological Areas
  - -variety of uncommon ferns;
  - -presence of Sassafras and Tulip Trees.

Southern Niagara Pin Oak Forest and Savannahs

- Description . high quality woodlot with a large representation of Carolinian species.
- Location . northwest corner of River Road and Allanport Road in Port Robinson;
  . Thorold.
- Plan Designations . none.
- Significance . Carolinian species/forest, identified by Carolinian Canada Project.

Morgan's Point

- Description . mixed forest peninsula on Lake Erie;
  . significant bird species present include Eastern Meadowlark, Eastern Kingbird, Black Tern, Spotted Sandpiper, Red-breasted Merganser, Blue-winged Teal, and Great Blue Heron.
- Location . central, southern margin of Wainfleet.
- Plan Designation . environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance . Philips Report site #42 of the Fragile and Unique Biological Areas
  -only regional location of a rare violet (Viola Palmata):
  . Brock ESA Report ESA Wf-21
  -important stopover point for migrating passerines;
  -unusually diverse vegetation distribution;
  -rare species include Shagbark and Pignut Hickory, Black Walnut, Swamp White Oak, Bitternut Hickory, and Canada Yew.

Chippawa Creek Conservation Area

- Description
  - . 148 hectare recreation and managed forest area, with a man-made lake;
  - . significant plant species include Rattlesnake Fern, Virginia Wild Rye, Wild Garlic, Black Chokeberry, Wild Geranium, Prickly Ash, Virginia Creeper, Wild Sarsaparilla, Virginia Waterleaf, Fly Honeysuckle, Butternut and Bitternut Hickory, Ironwood, Wild Plum, and Black Gum;
  - . significant wildlife inhabiting the area includes deer, Muskrat, Weasel, Ruffed Grouse, Screech Owls, herons, waterfowl, and songbirds.
- Location
  - . Regional Road 45, west of Wellandport;
  - . north-west portion of Wainfleet.
- Plan Designations
  - . environmentally sensitive area, in Regional Niagara Policy Plan (Welland River Corridor).
- Significance
  - . conservation area, owned by Niagara Peninsula Conservation Authority
    - -wildlife management (south of Regional Road 45);
    - -Northern Pike, Yellow Perch, and Largemouth Bass are found in man-made Dils Lake;
  - . Brock ESA Report ESA Wf-01 (Chippawa Creek Conservation and Wildlife Management Area)
    - -water storage area for the Welland River and Little Forks Creek;
    - -diverse selection of habitats (upland and lowland forests, marsh, successional meadow);
    - -rare plant species include Swamp White and Bur Oak, Slippery Elm, Black Walnut, Tupelo, and Eastern Flowering Dogwood.

Irish Grove

- Description . eight hectare, high quality example of Lake Ontario plain forest.
- Location . Hunter Road, in north-west Grimsby.
- Plan Designations . none.
- Significance . Brock ESA Report ESA Gr-09
  - -unusually high understory and crown species diversity and examples of large trees perhaps 200 years old;
  - -rare tree species present include Bitternut Hickory, Slippery Elm, and Eastern Flowering Dogwood;
  - -it had been reported that Cherry Birch were found on the site, more recent investigations could not locate this rare species;
  - . locally significant ANSI - Life Science.

Navy Island

- Description . 137 hectare island in the upper Niagara River
- Location . Niagara Falls.
- Plan Designations . Conservation in Niagara Falls Official Plan.
- Significance . Philips Report site #28 of Fragile and Unique Biological Areas
  - -large White-tailed Deer population;
  - -Pawpaw trees;
  - . provincially significant ANSI - Life Science (MNR) and candidate nature reserve (MNR)
  - -top priority protection because it does not occur elsewhere in the Site Region;
  - -only remaining example of a large river shoreline community in the upper Niagara River;
  - . IBP site
  - -rare tree species include Swamp White and Pin Oak, Black Walnut, Kingnut Hickory, Flowering Dogwood, and Sassafras;
  - -best stand of Black Locust in the Niagara Peninsula.

Forested Recreation Areas

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Stevensville Conservation Area 77
Smithville Conservation Area 77

Stevensville Conservation Area

- Description . 49 hectares of managed forest and recreation area.
- Location . on Black Creek, north side of Church Road, Stevensville;
  . Fort Erie.
- Plan Designation . environmentally sensitive area, in Regional Niagara Policy Plan (Stevensville Reservoir).
- Significance . conservation area, owned by Niagara Peninsula Conservation Authority
  -Ministry of Natural Resources.

Smithville Conservation Area

- Description . 4.45 hectare managed forest and recreation area.
- Location . north side of Twenty Road on Twenty Mile Creek, Smithville;
  . West Lincoln.
- Plan Designation . environmentally sensitive area, in Regional Niagara Policy Plan (Twenty Mile Creek Corridor).
- Significance . conservation area, owned by Niagara Peninsula Conservation Authority
  -north half leased to the Township of West Lincoln, and managed by Smithville and District Lions Club;
  -south half is undeveloped natural area.

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Wavecrest Bush

- Description
  - . five distinct but related woodlots totalling 43 hectares;
  - . southern section is poorly drained and has sand dune formations.
- Location
  - . west of Windmill Point Road, south of Nigh Road;
  - . east of Ridgeway in Fort Erie.
- Plan Designation
  - . none.
- Significance
  - . Brock ESA Report ESA FE-12
    - -rare species include Pignut Hickory, Swamp White and Pin Oak, Hop and Tulip Tree, Slippery Elm, Black Locust, Birdfoot Violet, and Eastern Flowering Dogwood.

Cyanamid Corners

- Description
  - . 60 hectare slough and ridge drainage forest;
  - . Thompson Creek runs through the area to the Welland River.
- Location
  - . north-west corner of Kalar Road and Chippawa Creek Road;
  - . south-west corner of Niagara Falls.
- Plan Designations
  - . none.
- Significance
  - . Brock ESA Report ESA NF-02
    - -excellent wildlife habitat, which supports deer, Ruffed Grouse, and Muskrat;
    - -rare species include Swamp White and Pin Oak, Chinquapin Oak, Black Walnut, and Black Locust.

Forks Creek Woods

- Description . 47 hectare wooded floodplain of Forks Creek.
- Location . south of the Welland River, between Hewitt and Gents Road;
  . Wainfleet, north-east corner.
- Plan Designations . environmentally sensitive area, in Regional Niagara Policy Plan (Welland River Corridor).
- Significance . Brock ESA Report ESA Wf-07
  -wildlife includes grouse and Great Blue Heron;
  -varied habitat (creek banks, marsh, successional meadows) allows for a high diversity of plant and animal species;
  -rare species include Swamp White and Pin Oak, and Pignut Hickory.

Comfort's Bush

- Description . 130 hectare deciduous swamp forest.
- Location . north and south of Highway 20, west of Fenwick;
  . east margin of West Lincoln.
- Plan Designations . none.
- Significance . Brock ESA Report ESA WL-20
  -water storage area and source of Fifteen Mile Creek and a tributary of the Welland River;
  -rare species include Eastern Flowering Dogwood, Pin Oak, Tupelo, and Black Gum.

Hafeman's Bush

- Description . 45 hectare woodlot with open wetlands.
- Location . south-east of Silverdale in West Lincoln.
- Plan Designations . none.
- Significance . Brock ESA Report ESA WL-10
  -headwaters for Fifteen- and Sixteen-Mile Creek;
  -high quality waterfowl habitat;
  -established deer population;
  -diverse range of biological habitats;
  -rare species include Swamp White Oak, and Pignut Hickory.

Sucker Creek

- Description . 95 hectare swampy woodlot.
- Location . Gainsborough Concession Road 4, east quarter of West Lincoln.
- Plan Designations . none.
- Significance . Brock ESA Report ESA WL-09;
  -high diversity of biological communities and related wildlife habitats;
  -deer, grouse, and pheasant inhabit the area;
  -headwaters of Sucker Creek, and flow contributor to Fifteen- and Sixteen Mile Creek;
  -rare species include Swamp White Oak, and Bitternut Hickory.

Moore Woodlot

- Description . 90 hectares of forested, undulating terrain.
- Location . southeast of intersection of Mountain Road and Spring Creek Road, north-west of Silverdale;
  . southern margin of Lincoln.
- Plan Designations . none.
- Significance . Brock ESA Report ESA Ln-01
  -headwaters of several tributaries of Twenty Mile Creek;
  -high species diversity created by a wide range of habitats;
  -deer and waterfowl are abundant;
  -rare species include Swamp White Oak, and Bitternut Hickory.

Silverdale Woodlot (South Ste. Anns Slough Forest)

- Description . 300 hectare contiguous landscape unit representative of Haldimand slough forests;
  . undulating terrain, with wet low areas.
- Location . north-east of Bismark and Highway 20, West Lincoln.
- Plan Designations . none.
- Significance . provincially significant ANSI - Life Science (MNR) and candidate nature reserve (MNR) called South Ste. Annes Slough Forest;
  . Brock ESA Report ESA NL-08 (Silverdale Woodlot)
  -headwaters for tributaries of Sixteen Mile Creek and the Welland River;
  -unusually high diversity of biological communities;
  -Swamp White Oak, Slippery Elm, and Bitternut Hickory.

Fletcher Woodlot

- Description . 30 hectares of ponds, successional meadow, and woodlots.
- Location . north-east corner of junction of Side Road 26 and Concession 6, Wainfleet.
- Plan Designations . none.
- Significance . Brock ESA Report ESA Wf-15
  - -significant wildlife species include Mallard, pheasant, Red-headed Woodpecker, Muskrat, Brush Wolves, Red Fox, Opossum, Mink, coyote, and Bald Eagle;
  - -rare plant species include Slipper Elm, Bitternut Walnut, Eastern Flowering Dogwood, and Black Walnut.

Chambers Corners Clay Plain

- Description . flat wet forest with treeless wet depressions.
- Location . north of Wainfleet Bog, at Port Colborne boundary.
- Plan Designations . none.
- Significance . IBP site;
  - -Great Blue Heron nesting area;
  - -rare plant species include Virginia Creeper, Pin and Swamp White Oak.

Marshville Station Clay Plain

- Description . many shallow ponds and an extensive, outstanding example of Carolinian zone swamp forest.
- Location . between Welland River and rail line to south, west of Highway 3A;
  . north-central Wainfleet.
- Plan Designations . none.
- Significance . IBP site
  -Great Blue Heron nesting area;
  -among the rare plant species are Bristly Sarsasparilla, and Pin and Swamp White Oak.

Leyburn Bush

- Description . 125 hectare swamp forest.
- Location . south-west of intersection of Spring Creek and Mountain Road;
  . north of St. Anns in West Lincoln.
- Plan Designation . none.
- Significance . Brock ESA Report ESA WL-18
  -headwaters for Spring Creek;
  -excellent example of mature, diverse, deciduous forest;
  -significant wildlife include deer and hawks;
  -rare plant species include Swamp White Oak, and Bitternut Hickory.

Harold Mitchell Nature Reserve (includes Long Beach Conservation Area to the south)

- Description
  - ponds, open marshes, and wooded slough-ridge terrain;
  - nature reserve owned by Niagara Falls Nature Club.
- Location
  - Wills Road, south of rail line and north of Long Beach Road;
  - south-west corner of Wainfleet.
- Plan Designations
  - environmentally sensitive area, in Wainfleet Official Plan Amendment No. 6.
- Significance
  - Philips Report site #44 of the Fragile and Unique Biological Areas
    - -last remaining stand of Hemlock trees along Lake Erie in the Niagara Region, according to the Nature Conservancy of Canada;
  - Brock ESA Report ESA Wf-18
    - -Swamp White Oak and Eastern Hemlock are among the rare species present.

Bartell's Bush

- Description
  - 140 hectares of managed woodlot, natural mature forest and wetland.
- Location
  - Shaw Road, north-west of Bismark in West Lincoln.
- Plan Designations
  - none.
- Significance
  - Brock ESA Report ESA WL-17
    - -flow contributor to Sixteen Mile Creek and tributaries of the Welland River;
    - -high quality habitat for gamebirds and deer;
    - -rare plant species include Swamp White Oak.

Spring Creek Bush

- Description . 140 hectares of wet forest.
- Location . Spring Creek Road, east of Smithville in West Lincoln.
- Plan Designation . none.
- Significance . Brock ESA Report ESA WL-16
  - -flow regulator for a tributary of Spring Creek;
  - -unusually high diversity of biological communities;
  - -rare species include Swamp White Oak, Wild Plum, and Bitternut Hickory.

Bismark Bush

- Description . 40 hectares of wooded rolling terrain and wet lowlands representative of Haldimand slough forest.
- Location . north-east of Bismark in West Lincoln.
- Plan Designations . none.
- Significance . Brock ESA Report ESA WL-14
  - -habitat for Great Blue Heron, Ruffed Grouse, and deer;
  - -headwaters for tributaries of Parker's Creek;
  - -rare plant species include Swamp White Oak, and Bitternut Hickory.

Hardy's Wood

- Description . 130 hectares of wooded rolling terrain and wet lowlying troughs with several open marshes.
- Location . north-west of Bismark, west of Highway 20, in West Lincoln.
- Plan Designations . none.
- Significance . Brock ESA Report ESA WL-07
  -headwaters for Parker's Creek;
  -unusually high diversity of biotic habitats;
  -rare plant species include Swamp White Oak and Tupelo (Black Gum).

Garber's Grove

- Description . 105 hectares of wooded rolling terrain with small open marshes and intermittent streams.
- Location . north-east of Winslow, Concession V in West Lincoln.
- Plan Designations . none.
- Significance . Brock ESA Report ESA WL-15;
  -high quality wildlife community, including Red Fox, deer, raptors, Ruffed Grouse, and snakes;
  -rare plant species include Swamp White Oak and Shagbark Hickory;
  -water storage area for Twenty Mile Creek and the Welland River.

Durham Oak Grove

- Description . 40 hectare wet forest.
- Location . east of the Mud Road - Thirty Street intersection in south Grimsby.
- Plan Designations . none.
- Significance . Brock ESA Report ESA Gr-06
  -flow regulator for Spring Creek;
  -rare species include Swamp White Oak.

Pot's Woodlot

- Description . 105 hectares of wooded rolling terrain with wet lowlying areas.
- Location . between Bismark and Winslow on Regional Road 65, in West Lincoln.
- Plan Designations . none.
- Significance . Brock ESA Report ESA WL-13
  -water storage area for Beaver Creek;
  -significant wildlife inhabitat the area, including deer, woodpeckers, and Red-tailed Hawks;
  -rare plant species include Swamp White Oak.

McCready's Bush

- Description . 100 hectare wet forest.
- Location . south-east of Caistor Centre in West Lincoln.
- Plan Designations . none.
- Significance . Brock ESA Report ESA WL-05
  -headwater for tributaries of the Welland River;
  -unusually high diversity of biological communities;
  -nesting area for Turkey Vultures;
  -important habitat for deer and waterfowl;
  -rare species include Swamp White Oak.

Ruigrok Tract (Caistor-Canborough Slough Forest)

- Description . 530 hectare wet forest that extends into Haldimand-Norfolk, the largest flat wooded area in the Niagara REgion.
- Location . south of Caistor Centre adjacent to Regional Niagara boundary with the Region of Haldimand-Norfolk in West Lincoln.
- Plan Designations . environmentally sensitive area in Regional Policy Plan.
- Significance . Provincially significant area of natural and scientific interest, extensive habitat for wildlife that require large areas, diverse array of slough/ridge patterned clay plain.
  . considered a Carolinian forest by Carolinian Canada Project.
  . satisfies 7 of 9 criteria as an Environmentally Sensitive Area in Brock ESA Report (WL-06), headwater area for Welland River, rare tree species include Swamp White Oak and Eastern Flowering Dogwood, a diversity of mamalian species including Southern Flying Squirrel, Wolf, Bobcat, White-tailed Deer and Coyote have been reported in this wooded area.

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Ridgemount Quarry

- Description . abandoned limestone quarry with good (8.38 metres) section of geological stratigraphy of the Edgecliff member of the Onondaga formation.
- Location . Ridgemount Road at Bertie Road in Fort Erie.
- Plan Designations . none.
- Significance . provincially significant ANSI - Earth Science (MNR).

Humberstone Quarry

- Description . abandoned limestone quarry with a representative 12.1 metres of Bertie formation dolostones.
- Location . Concession II, Lot 23 in Port Colborne.
- Plan Designations . none.
- Significance . provincially significant ANSI - Earth Science (MNR)
  -extremely diverse fossil fauna;
  -excellent exposure of middle Devonian strata.

Ridgewood Raised Beach

- Description . glacial era lake shoreline parallel to Lake Erie (35 hectares).
- Location . Garrison Road, east of Ridge Road in Fort Erie.
- Plan Designations . none.
- Significance . provincially significant ANSI - Earth Science (MNR) and candidate nature reserve (MNR)
  -rare and best example of Lake Dana beach ridge.

Shisler Point Woods (Empire Beach Backshore Basin Forest)

- Description . large (83 hectare) swamp forest behind (north of) backshore dune ridge.
- Location . just west of Sherkston along Lake Erie in Port Colborne.
- Plan Designations . shoreline policy area, in Regional Niagara Policy Plan.
- Significance . provincially significant ANSI - Life Science (MNR) and candidate nature reserve (MNR) called Empire Beach Backshore Basin Forest
  -least disturbed backshore wetland basin swamp forest of entire north shore of Lake Erie;
  . Brock ESA Report ESA PC-06 (Shisler Point Woods)
  -rare plant species include Pignut Hickory.

Point Abino Peninsula Sandland Forest and Sand Ridges

- Description
  - large sand dunes of 20 to 30 metres in height frame the entire west side of the peninsula, with a remnant virgin forest;
  - beach ridge along east side of Point Abino is a linear sand formation of 2 to 6 metres;
  - significant waterfowl, shorebirds, and other avian species include Evening and Rose-breasted Grosbeaks, Red-headed Woodpecker, Hairy and Downy Woodpecker, Spotted Sandpiper, Ruby-throated Hummingbird, Eastern Kingbird, Rufous-sided Towhee, Mallard, Bufflehead, White-winged Scoter, Red-tailed and Sparrow Hawks;
  - rare plant species include White and Red Trillium, Virginia and Broad-leafed Waterleaf, Wild Honeysuckle, Wild Leeks, Ironwood, Wild Ginger, Bugseed, Tulip Tree, Seaside Purge, Canada Waterleaf, Northern Arrowood, Elm-leaved Goldenroad, Glade Fern, Ebony Spleenwort, Thorowort Pondweed, Tufted Hairgrass, Scribner's Panic Grass, Billwort, Wild Yam, Chinquapin and Swamp White Oak, Yellow Corydalis, Drummond's and Lyre-leaved Rock-cress, Trailing Wild Bean, Yellow Flax, Hop Tree, Virginia Bluebells, Low Calamint, Squawroot, Hairy Bedstraw, Toll Bellflower, Lance-leaved Tickseed, and Cut-leaved Goldenrod.

- Location
  - south half of Point Abino peninsula in south-west Fort Erie.

- Plan Designations
  - environmentally sensitive area, in Regional Niagara Policy Plan.

- Significance
  - Philips Report site #38 of the Fragile and Unique Biological Areas
    - -spring migrant diving ducks, along with Acadian Flycatchers and Carolina Wrens, frequent here;
  - provincially significant ANSI - Life Science (MNR);
  - Carolinian species/forest, identified by Carolinian Canada Project;
  - IBP site (Point Abino Sand Hills)
    - -exceptional diversity of herbs and spring wildflowers;
    - -rare plant species include Bitternut Hickory, Eastern Hemlock, and Creeping Spike Moss;
  - Brock ESA Report ESA FE-11 (Point Abino).

Nickel Beach Woodlot

- Description . continuation of the wooded Lake Erie shoreline dune complex (47 hectares).
- Location . Reuter Road in southern Port Colborne.
- Plan Designations . shoreline policy area, in Regional Niagara Policy Plan.
- Significance . Brock ESA Report ESA PC-04
  - -rare plant species include Eastern Hemlock, Pin and Bur Oak, and Bitternut Hickory.
  - -significant wildlife species include deer, Red-tailed Hawk, and Downy Woodpecker.

Other Sites of Rare Flora and Fauna

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Rose Hill Road 97
Ussher's Creek 97
One Mile Creek 98
Progressive Avenue and Ninth Street 98
Garner Road Woodlot 98
North of Holland Road at Highway 406 99
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Erie Beach

- Description . sandy shoreline of Lake Erie.
- Location . south of Lakeshore Road in the south-east margin of Fort Erie.
- Plan Designations . environmentally sensitive area, in Regional Niagara Policy Plan.
- Significance . Philips Report site #35 of the Fragile and Unique Biological Areas
  - -only known location of Wild Licorice in North America east of the Mississippi River;
  . IBP site
  - -migrating birds present, including Brown Pelican;
  - -rare plant species include Wild Licorice, Hop Tree, Broad-leaved and Shining Ladies' Tresses.

Miller Creek

- Description . clay floodplain of Miller Creek.
- Location . south of Miller Creek Park in north-east quarter of Fort Erie.
- Plan Designations . none.
- Significance . IBP site
  - -only station of Wild Hibiscus in the Niagara Peninsula;
  - -Kingnut Hickory, located downstream, is very rare to Canada.

Rose Hill Road

- Description . typical habitat for north shore of Lake Erie.
- Location . Rose Hill Road, next to old Bertie Township waterworks plant, in Fort Erie.
- Plan Designations . none.
- Significance . Philips Report site #37 of the Fragile and Unique Biological Areas
  -site of the largest Tulip Tree in Canada.

Ussher's Creek Mouth

- Description . floodplain of Ussher's Creek at the Niagara River.
- Location . south-east margin of Niagara Falls.
- Plan Designations . environmentally sensitive area, in Regional Niagara Policy Plan; conservation in Niagara Falls Official Plan.
- Significance. . Philips Report site #29 of the Fragile and Unique Biological Areas
  -first recorded location in Canada of the Green Arrow Arum plant;
  . Philips Report site #30 of the Fragile and Unique Biological Areas
  -one of three Big Shellbark Hickory Trees found in the Niagara Peninsula.

One Mile Creek Mouth

- Description . One Mile Creek at Lake Ontario.
- Location . north-east margin of Niagara-on-the-Lake.
- Plan Designations . none.
- Significance . Philips Report site #22 of the Fragile and Unique Biological Areas
  -only known native Scarlet Maple Tree remaining in the Niagara Region.

Progressive Avenue and Nineth Street

- Description . remnant Lake Ontario plain forest.
- Location . St. Davids in southern Niagara-on-the-Lake.
- Plan Designations . none.
- Significance . Philips Report Site #24 of the Fragile and Unique Biological Areas
  -rare tree species include Pawpaw, Prickly Ash, and Big Shellbark Hickory;
  -only Canadian location of the True Katydid insect.
  . Also referred to as Zuk's Zone in Brock ESA report.

Garner Road Woodlot

- Description . small wet forest.
- Location . south of Lundy's Lane in western Niagara Falls.
- Plan Designations . none.
- Significance . Philips Report site #27 of the Fragile and Unique Biological Areas
  -Tupelo or Sour Gum Tree is found here;
  -one of four known Canadian locations of Round-leaf Greenbriar;
  . locally significant ANSI - Life Science.

North of Holland Road at Highway 406

- Description . site of the only specimen of Prince's Pine in the Niagara Peninsula.
- Location . southern Thorold.
- Plan Designations . none.
- Significance . Philips Report site #14 of the Fragile and Unique Biological Areas.

Cream and Welland Streets

- Description . site of the largest Cucumber Magnolia Tree in the Niagara Region.
- Location . Fenwick in western Pelham.
- Plan Designations . none.
- Significance . Philips Report site #5 of the Fragile and Unique Biological Areas.

APPENDIX II

Schematic Maps of the Natural Areas

Environmentally Sensitive Areas

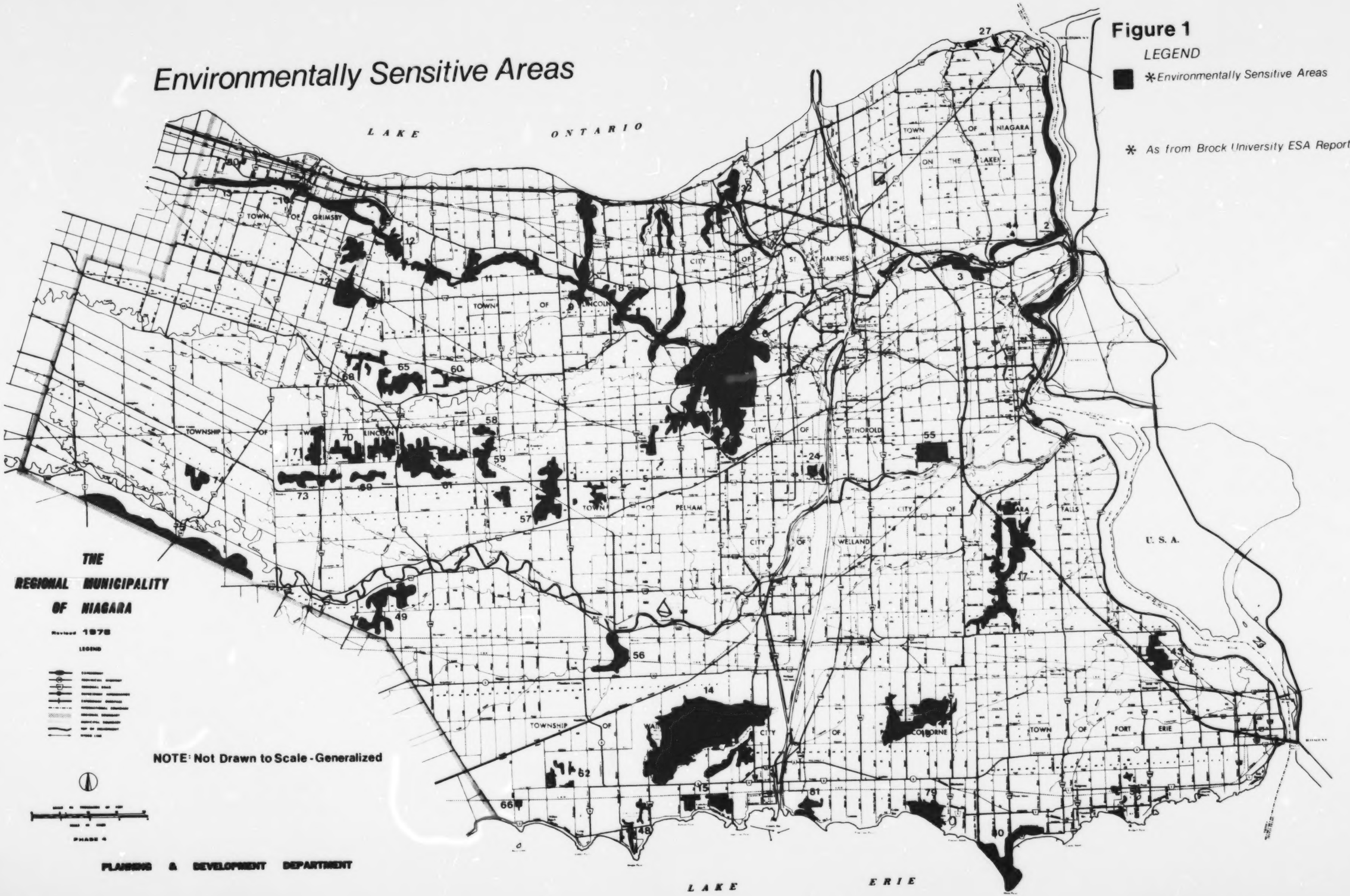

Figure 1

LEGEND

*Environmentally Sensitive Areas

* *As from Brock University ESA Report*

THE REGIONAL MUNICIPALITY OF NIAGARA

Revised 1978

LEGEND

NOTE: Not Drawn to Scale - Generalized

PHASE 4

PLANNING & DEVELOPMENT DEPARTMENT

Ministry of Natural Resources Classifications and IBP Sites

Figure 2

LEGEND

- Provincially Significant Areas of Natural and Scientific Interest and Carolinian Canada Areas and Candidate Nature Reserves
- Provincially Significant Waterfowl Habitats
- Provincially Significant Fisheries
- International Biological Programme Sites

LAKE ONTARIO (36)

TOWN OF GRIMSBY

TOWNSHIP OF WEST LINCOLN

TOWN OF LINCOLN

CITY OF ST. CATHARINES

TOWN OF NIAGARA ON THE LAKE

CITY OF THOROLD

CITY OF NIAGARA FALLS

CITY OF WELLAND

TOWNSHIP OF WAINFLEET

CITY OF PORT COLBORNE

TOWN OF FORT ERIE

U. S. A.

LAKE ERIE (34)

THE REGIONAL MUNICIPALITY OF NIAGARA

Revised 1978

LEGEND

NOTE: Not Drawn to Scale - Generalized

PHASE 4

PLANNING & DEVELOPMENT DEPARTMENT

Niagara Peninsula Conservation Authority Areas and Ministry of Natural Resources Wetland Classifications

Figure 3

LEGEND

- Niagara Peninsula Conservation Authority Areas Having Natural Areas
- * Provincially Significant Wetlands (Class 1&2)
- * Preliminary Classification

LAKE ONTARIO

TOWN OF GRIMSBY

TOWN OF LINCOLN

CITY OF ST. CATHARINES

TOWN OF NIAGARA ON THE LAKE

TOWNSHIP OF WEST LINCOLN

TOWN OF PELHAM

CITY OF THOROLD

CITY OF WELLAND

CITY OF NIAGARA FALLS

U. S. A.

TOWNSHIP OF WAINFLEET

CITY OF PORT COLBORNE

TOWN OF FORT ERIE

LAKE ERIE

THE REGIONAL MUNICIPALITY OF NIAGARA

Revised 1978

LEGEND

NOTE: Not Drawn to Scale - Generalized

PHASE 4

PLANNING & DEVELOPMENT DEPARTMENT

Niagara Escarpment Plan Natural Areas and Philips Report Sites

Figure 4

LEGEND

- *Escarpment Natural Areas*
- ● ✻ *Fragile and Unique Biological Areas*

✻ *Philips (1972). Official Plan Studies - Report Number 11*

Municipal Plan Designation

Figure 5

LEGEND

Policy Plan Environmentally Sensitive Areas

Local Municipal Natural Area Designations (ESA's, EPA's, Special Rural, Conservation)

LAKE ONTARIO

TOWN OF GRIMSBY

TOWN OF LINCOLN

CITY OF ST. CATHARINES

TOWN OF NIAGARA ON THE LAKE

TOWNSHIP OF WEST LINCOLN

TOWN OF PELHAM

CITY OF THOROLD

CITY OF WELLAND

CITY OF NIAGARA FALLS

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PLANNING & DEVELOPMENT DEPARTMENT

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